IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication JUNE 29, 1961

Capital Goods Markets:

RECOVERY FORCES Are at Work

A Special Report on Metalworking Capital Appropriations p. 49

New Price Cuts Flare Up In Metal Can Battle p. 35

Ratios Cut Handling Costs p. 67

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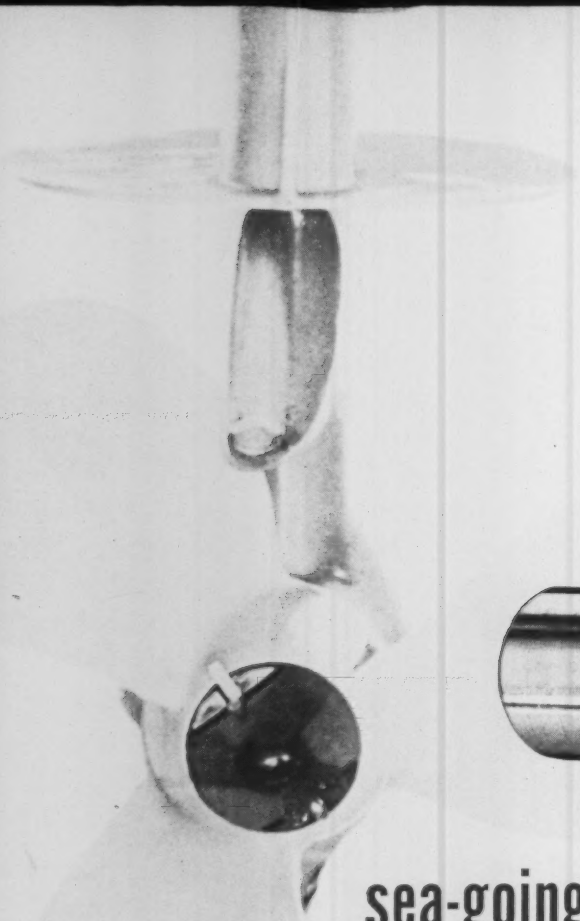

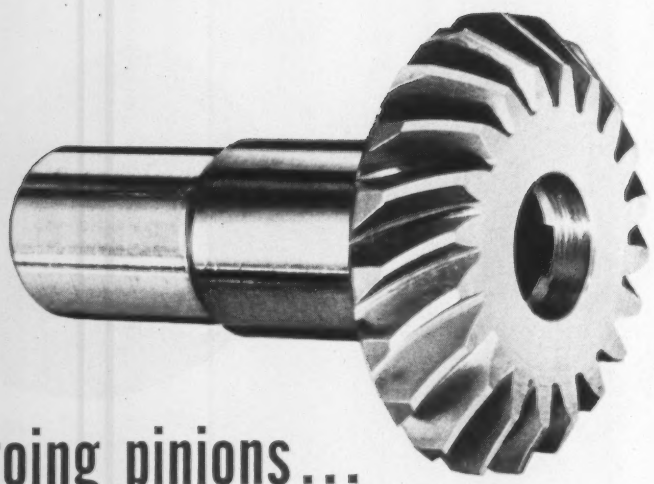

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Shipped recently to the General Electric Company's Large Steam Turbine Generator Department at Schenectady, N. Y., this shaft weighs 233,865 lb and measures 38 ft, 9½ in. long. The shaft will be machined and assembled by G. E. for a turbine-generator unit to serve Tennessee Valley Authority's Paradise Steam Generating Station at Paradise, Ky.

The 116-ton shaft was forged from a 120-inch diameter ingot that required the combined output of five electric-furnace heats, or roughly 260 tons of vacuum-poured, nickel-moly-vanadium steel. It was the largest ingot ever cast in a vacuum by Bethlehem. No larger generator shaft has ever been forged.

The generator shaft was fully heat treated and sonic tested. It has a maximum body diameter of 59¼ in.; minimum diameter of the forging is 11¼ in. The generator will operate at 1800 rpm, providing a maximum electrical output of 391,111 kva.

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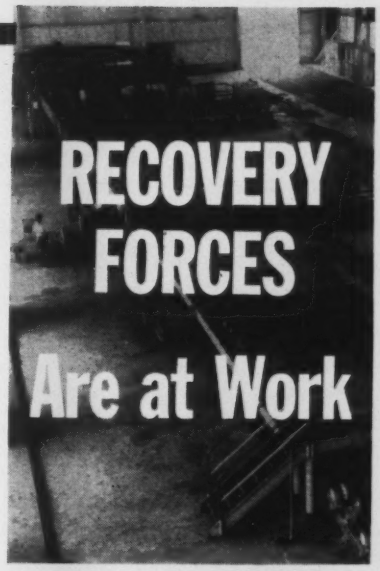
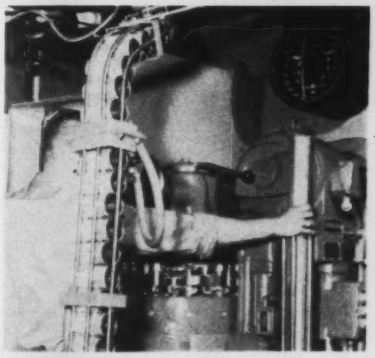


Survey Points to Capital Goods Upturn

Metalworking companies raised new first quarter capital appropriations 32 pct over fourth-quarter '60. This could mean more spending for capital equipment in the months to come. Leading the upswing is a 90 pct fourth-to-first quarter boost in new capital outlays by primary metals producers. p. 49



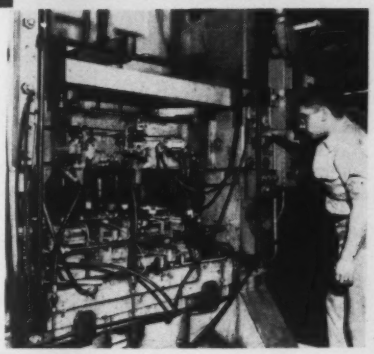
Aluminum, Tinplate in Price Battle

Competition between aluminum and tin plate for the frozen citrus can market intensifies. Prices of aluminum cans and can stock have been cut. Target is thin tinplate, now making a major move into the can market. p. 35

Ratios Reveal Hidden Handling Costs

Materials-handling costs involve more than the price you pay for a lift truck plus the operator's wages. You can use seven simple ratios to pinpoint all hidden costs. These low-yield expenses will probably surprise you. Why not eliminate them? p. 67

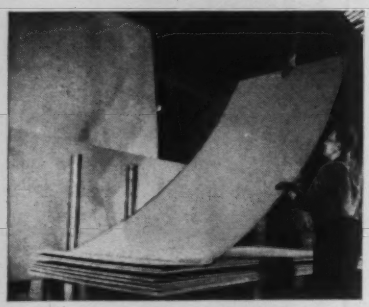
Next Week



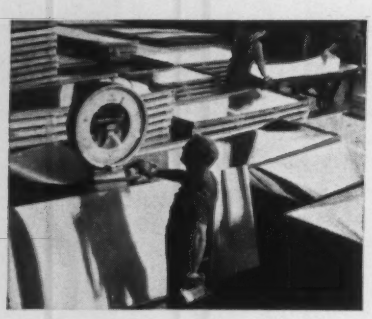
Cold-Extrusion Barriers Melt Away

Early cold-forging attempts haven't all been successful. Too often, a company is bogged down in a maze of obstacles. Next week's report tells how mushrooming applications are rolling over development snags. Barriers fade as cold-extrusion comes of age.

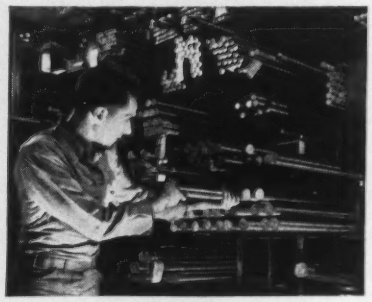
BUYERS' GUIDE . . .
to Ryerson service on stainless



PLATES—Available in 9 analyses including plates to Atomic Energy Commission requirements and to ASTM specifications for code work. Also low carbon types for easy welding.

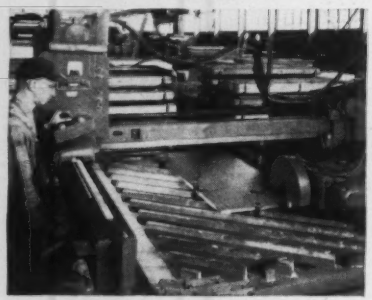


SHEETS—11 analyses of Allegheny stainless sheets in stock including nickel and straight chrome types. Also extra wide sheets to reduce welding costs, expanded and perforated sheets.

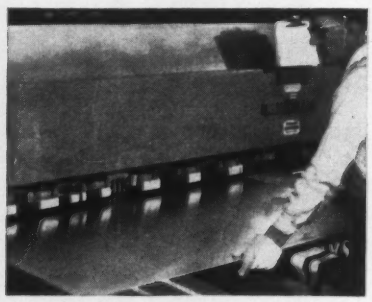


BARS AND ANGLES—Rounds, squares, flat's, hex's and angles in 8 types including free-machining bars with both analysis and mechanical properties controlled.

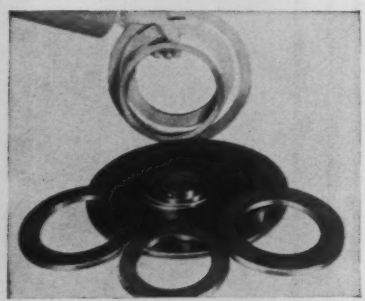
HELIARC CUTTING available on request. Cleaner, smoother cut edges. Better machining because of minimum contamination and distortion. Less carbide precipitation.



TRUE-SQUARE ABRASIVE CUTS. —Stainless plates to 12' x 25' cut true square on abrasive disc machine. Length and width tolerance plus or minus 1/32".



SHEARING—Accurate cutting of stainless sheets and light plate to the industry's tightest specifications. Shear hold-down clamps padded to protect sheet finish and flatness.



RINGS AND DISCS—Machine cut to your order. This service assures size accuracy, smooth edges, flatness and unaffected corrosion resistance—a lower-cost, ready-to-use product.

HEADS—A.S.M.E. flanged and dished heads in types 304, 304L, 316 and 316L are on hand in large quantities, and in a wide range of gauges and sizes.

PIPE AND TUBING—Light wall, standard and extra heavy pipe, ornamental and regular stainless tubing. Also screwed type and welding fittings and Cooper stainless valves.

RYERSON METALOGICS

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STEEL · ALUMINUM · PLASTICS · METALWORKING MACHINERY

Haste Makes Waste In International Affairs!

Domestic affairs often require a little haste. We are in a competitive market. Dragging one's feet may lose the sale.

But internationally, things are different. There we are dealing with long term objectives, our own as well as those of the Soviets and the Chinese Reds.

For years we have accepted the view that anything was all right as long as we did something. The present Administration is more guilty of this than the previous Administration.

The idea that we ought to do this or that as quickly as possible often hides uncertainty as to what really ought to be done. The crisis approach is often used to jam through something that is a poorly-thought-out solution to something that may have no solution.

The Reds are biding their time and letting us blitz ourselves. Often a lonely citizen is capable of making a more intelligent move than some of the moves made in Washington. Most government action today is based on judgment—or lack of judgment—of what we can do to meet the Red threat.

The Castro fiasco certainly was not thought out. Some will say let it go; forget about it. That is head-in-the-sand thinking. Then we had the meeting at the summit. A summit that turned out to be a slight pile of dirt in a large pit.

All that was learned was what top-level career men could have told anyone. In fact, J. Edgar Hoover has been saying for years what we found out in Austria: You can't trust the Reds for a minute and you can't believe anything they say because they don't talk or think in our terms.

Tinsel, parades, newscasts, television-firsts, hand shaking, smiles, fashion notes, action for action's sake, and, finally, conclusions that are not new but old ones warmed over will not cover up our problems. Neither will haste, billions for the foreign aid rathole and weekly lectures to the American people on their lack of sacrificial enthusiasm.

We need more time for more long-term planning. We need more attention to career men, less to the Johnny-come-latelies. We need less dependence on off-the-cuff cliches. We need tough thinking, judgment of the highest order, and advice from people who know what they are talking about.

As long as we run from one ill-conceived "solution" to another, we are committing national suicide—inch by inch.

Tom Campbell

Editor-in-Chief

Take a Ledloy® steel—Inland's famous family of free machining steels—and give it all you've got! Go on—double and triple your normal speeds. Up to 325 sfm is common with Ledloy and believe us, far greater speeds are perfectly possible—up to 450 sfm with high speed tools —600 sfm with carbide tooling. ■ Step up the feed, too. Drill at 40 inches per minute at 750 rpm if you have the equipment for it. Matter of fact, you can't tell how much faster—better—you can do with a Ledloy steel 'til you've pushed it to the limit. ■ One thing to remember—you won't get these amazing results with just any leaded steel. To get the most out of your equipment, use Inland Ledloy—the original leaded steel. ■ That's right—Inland made leaded steels long before anyone else—has been developing the unique properties of Ledloy steels for more than 20 years—can recommend exactly the right type for your shop and your product. So use Ledloy steels—hit them with all you have...

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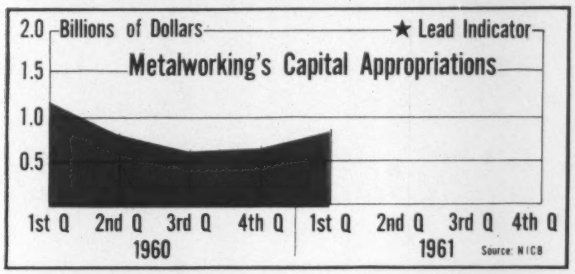
Capital Spending Takes Upturn

Increased capital spending plans by metalworking



companies brighten the fourth quarter outlook for capital goods makers.

New capital appropriations by the metalworking industry were boosted some 35 pct from the fourth to first quarter of this year. And, for the first time in over a year, the industry raised, rather than lowered new set asides for plants and equipment.

These results are from the IRON AGE's most recent survey of metalworking's capital appropriations (See p. 49). Leading the first quarter upturn were primary metals producers with a quarter-to-quarter gain of 90 pct. Spearheading the group's higher capital outlays was a 134 pct rise by the steel industry.

Corporate Finances Are Liquid

It's well-known that U. S. corporations are ready for busier times ahead as far as production capacity is concerned. But they are also ready as far as working capital is concerned.

The Securities and Exchange Commission estimates working capital at the end of the quarter amounted to $134.3 billion, a gain of $1.8 billion during the period.

Soft Prices Puzzle Everyone

Current softening of industrial prices has caught everyone by surprise. There is no precedent in postwar recoveries for present price behaviour.

What's the answer? The truth is the patient is still under diagnosis. There may be answers for steel price actions (IA, 6/22/61, p. 88), but not for all.

The price enigma highlights the fact that not enough is known about new (and altered) forces in business. The impact of these new forces may be causing the price surprises.

One force: Inter-industry competition. Example: Stainless steel price cuts largely aimed at aluminum.

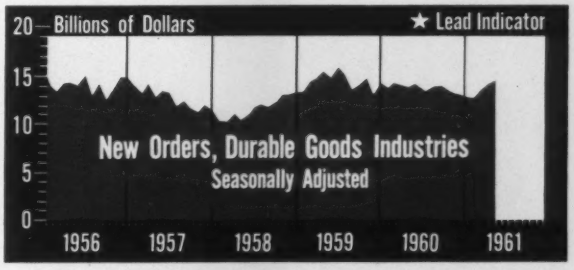
Other forces: Tougher foreign competition, big increase in diversified-lines manufacturing (one line can tackle a price war while other lines make the profits), and industry swing to marketing emphasis.

Durable Goods Orders Up Again

New orders and sales of durable goods makers scored their fourth straight month-to-month rise in May. New orders, seasonally adjusted, rose to $14.9 billion, up 2 pct from April. Sales increased 3 pct over April to $14.6 billion.

Significantly, May marked the fourth consecutive month that new orders exceeded sales. This promises further strength in durable goods business.

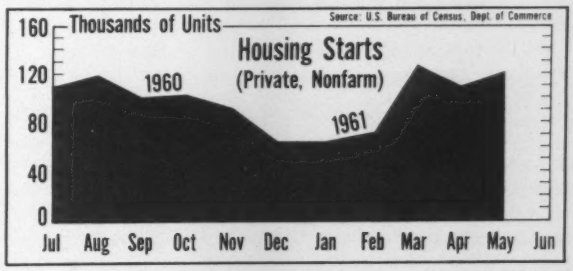
However, a test is shaping up. Steel and auto gains have sparked recent advances. With steel slipping a bit in the face of the summer letdown, and the auto



selling season passing its peak, broader durable goods gains are needed to advance from present levels.

More Houses Started In May

Private non-farm housing starts showed a better than seasonal gain in May. Work was started on 121,700 units in May compared to 109,600 in April. Housing starts in May, on a seasonally adjusted annual rate, rose to 1.3 million units. This is up from 1.2 million units in April, but about 3 pct below year-ago levels.



Buyer demand, of course, will ultimately determine future housing starts. But builders report big cost hurdles in the way of their giving greater housing values to stir demand. The hurdles: Rising wage and land costs and costlier building site development.

How Koroseal handles some pretty tough customers

THE tough customers in this case are those pistons—millions of them; oily, sharp-edged—which travel the production line on conveyor belts. Keeping the pistons moving was so tough that it ruined belts in only 4 months. Their sharp edges cut grooves in the belts, ripped them. Oil soaked into the belt covers, softened them, formed a dirty scum on the surface. Belts had to be cleaned and repaired constantly.

When a B.F.Goodrich distributor heard of the problem, he recommended a BFG conveyor belt made of Koroseal vinyl. Koroseal resists scuffing, tearing, cutting; it stands oil, grease, most acids and just about everything else that ruins other materials. It can be vulcanized into a continuous belt, eliminating troublesome fasteners. And since oil can't soak into its smooth, polished surface, a Koroseal belt wipes clean easily, quickly.

A B.F.Goodrich Koroseal belt was installed. After a year's service, it was still going strong—had lasted three times longer than the belt it replaced—carried over 2 million pistons.

Your B.F.Goodrich distributor has the exact specifications for the Koroseal belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about the many products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-130, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

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CONVEYOR BELTS

NMU: T-H Injunction To Get Ships Moving?

As the strike by five maritime unions entered its second week, the government moved to get the nation's merchant fleet out to sea again by means of a Taft-Hartley injunction.

Last week, Labor Secretary Arthur Goldberg met rebuff from the unions when he suggested a voluntary 60-day cooling-off period. Three unions have countered with a proposal to move "essential" cargo. However, as in the steel strike, where a proposal was made to make steel for essential defense needs, the difficult question would be to determine what is "essential."

SHIPPING: All tied up.

Many of the nation's oil refineries are closed or operating only partly. Would fuel for civilian use be "essential" under the union proposal? The proposal itself was vague.

Of the five unions involved, the National Maritime Union is the largest. Others are: Masters, Mates and Pilots Organization; American Radio Assn.; Seafarers International Union; and Marine Engineers Beneficial Assn.

Each has individual demands. But they are united on the big issue: They want the companies to bargain for U. S.-owned ships registered in other countries. Most "flags of convience" ships are tankers flying the national flags of Panama, Liberia or Honduras.

The unions say that the lower wages, longer working hours, and lower safety requirements permit these ships to compete unfairly against American ships. This, they say, is costing their members jobs.

UAW: Chrysler Warned It Could Be Struck

UAW vice president Norman Matthews sounded a strike warning to Chrysler Corp. during a Chrysler Council meeting in Detroit last week. Chrysler and the union begin negotiations June 30.

"Chrysler will get a strike," he said, "unless it steps up to its responsibility and provides equity for our people."

He said there are more problems at Chrysler than at Ford Motor Co. or General Motors Corp.

"We hope there won't be a strike but if we have to take Chrysler on we will," he said.

According to a recently released UAW press memorandum, there are currently 90,000 Chrysler workers covered by UAW national agreements, indicating 46,000 laid off.

Ford's Key to Labor Harmony

Conflict between labor and management is the spectacular aspect of industrial relations, but the major part of the job is to promote harmony and cooperation among employes at all levels of the company.

This was explained by M. L. Denise, Ford Motor Co. vice president—labor relations.

He says the difference between corporate success and failure depends very largely on the extent to which conflict between people is outweighed by cooperation.

The contract between Ford and the UAW, up for renegotiation this week, "assures management and the union an acceptable way of living and working together for its duration," he says.

"But at the same time it also means that some unresolved differences will be waiting to be settled—or resettled—when the contract expires.

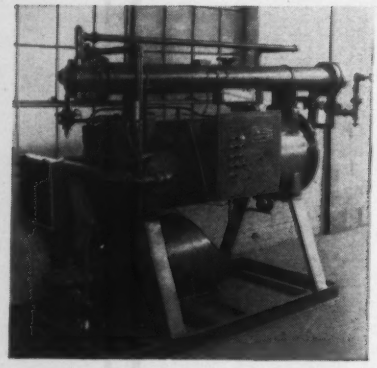
"Since all of these disagreements have to be settled one way or another during the negotiations, we often get some pretty spectacular fireworks."

Mr. Denise says the main tasks of industrial relations continue after the agreement is signed, since "more of our time is devoted to contract administration than to any other one thing."

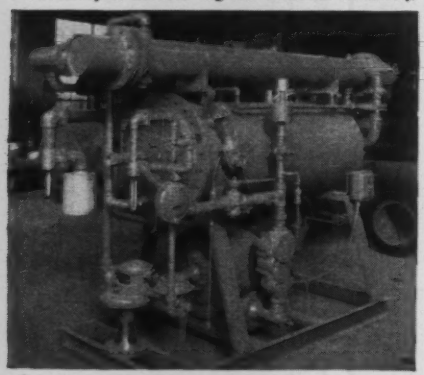
He says Ford's primary goal in contract administration is to insure reasonably uniform adherence to the terms of the contract while at the same time trying to avoid a narrow, legalistic approach.

Mr. Denise asserts that the biggest threat to the working relations between the company and the union comes when the contract expires. "At this point," he said, "All limitations on the right to strike are off."

Which of these 3 KEMP GAS GENERATORS *do you need in your plant?*

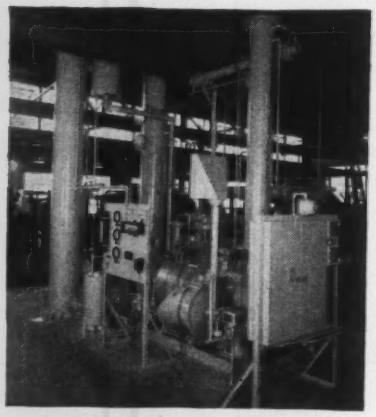


1 KEMP INERT GAS GENERATOR
—for working non-ferrous metals. Produces inert gases for use at low or high pressure, desiccated or unprocessed. Kemp gives you low-cost gas generation, completely automatic operation. Premixing in exclusive Kemp Carburetor and constant analysis assures highest thermal efficiency.



2 KEMP ATMOS GAS GENERATOR
—for working low-carbon steels. For gases low in carbon dioxide. As in all Kemp Gas Generators, test burner permits checking for proper combustion characteristics before igniting burners. Another safety feature: automatic fire-checks guard against flashback.

3 KEMP NITROGEN GENERATOR
—for working high-carbon steels. Completely eliminates CO_2 from gas, produces 99+% nitrogen. Features the easy start-up typical of all Kemp Generators. Vernier dial can be locked in position to maintain exact fuel-air ratio without further control manipulation.



The Kemp representative in your area can advise you on the type and size of generator to best solve your problem. Talk to him or write: The C. M. Kemp Manufacturing Company, 405 E. Oliver St., Baltimore 2, Maryland.

It always pays to come to

KEMP OF BALTIMORE

THE C. M. KEMP MANUFACTURING COMPANY
405 E. Oliver St., Baltimore 2, Md.

★ Business Tax Plan Falters

President Kennedy's tax credit plan for business seems a sure bet for compromise or no action at all in Congress this year. Industry, particularly, is looking for a compromise.

Industry's preference for a compromise is actually quite a switch from its former all-out opposition to the proposed tax incentive for investment in plant modernization.

Among groups stating a new position on the tax credit are the Machinery and Allied Products Institute and the National Machine Tool Builders Assn.

Industry switched its stand when it became apparent the tax credit plan was all it could get out of the Administration this year. It wanted overall depreciation reform. But the Administration said no.

Now, industry may not even get a tax credit plan.

Congressional doubts are being raised about the tax credit plan, especially from Republicans. These doubts were spurred by industry's original all-out opposition.

The Administration is pushing to get a vote on some compromise tax bill before Congress adjourns this summer. But it is doubtful the bill will get to the White House by then.

A compromise is likely to come in the form of a flat tax credit of perhaps 10 pct for new plant investment. It is felt this is more equitable than the bracket structure suggested by the Administration.

MAPI summed up industry's new position with these observations:

1. That it now understands the tax credit plan is not offered as a substitute for a basic reform of tax depreciation.

2. That a compromise, such as flat rate credit of 10 pct of all eligible investment, would be acceptable.

3. That the tax incentive proposal be reviewed separately from the other tax proposals.

4. That the compromise plan have across-the-board application at a rate of at least 30 pct.

■ Retirement Tax Plan Faces Fight

A bill to give businessmen a tax break in setting up their retirement programs has passed the House, but faces strong opposition in the Senate.

The bill would permit a self-employed person to deduct from taxes up to 10 pct of his yearly income, if placed in an approved retirement fund. The limit in any year would be $2500.

Taxes would be due on these funds when withdrawn on retirement, but the taxpayer then would be in a lower tax bracket.

The Senate twice in the past four years has killed similar measures. The Kennedy Administration has asked Congress to delay action on the bill until next year, when it could be considered with an overall tax bill.

■ Pentagon Combats Defense Work Waste

The Pentagon may soon devise a program to penalize industries which waste defense dollars. The program would also reward excellent performance in defense contracting. Penalty or reward would be in the form of less or more profits.

Hints of the new program are being made by top Pentagon officials. Defense Secretary Robert McNamara says it is the responsibility of the Defense Dept. to make industry work on government contracts "as efficient and economical" as possible.

"The first thing we can do toward this end," he says, "is devise arrangements which reward efficiency and penalize waste."

Sec. McNamara is backed up by Roswell L. Gilpatric, deputy defense secretary for procurement, who says the Defense Dept. will work out "a practical, acceptable system for rewarding good cost performance through greater profit incentives, while penalizing substandard performance through reduction in profits or fees."

■ Kefauver Packages Price-Fixing Points

Sen. Estes Kefauver (D., Tenn.), has put his anti-price-fixing program into a five point package.

1. Corporate officials should be made personally responsible for stopping price-fixing practices;

2. When a pattern of identical or similar bids emerges, Govt. purchasing agencies should be required to obtain a certificate to the effect that no collusion has occurred.

3. The presence of such a pattern should create a legal presumption of collusion and shift the burden of proof to the bidders;

4. The executive order requiring purchasing agencies to submit evidences of identical bidding to the Justice Dept. should be enacted into law; and,

5. Section 1 of the Sherman Act should be amended to make clear that an attempt to restrain trade by fixing prices is prohibited, whether or not a sale takes place.

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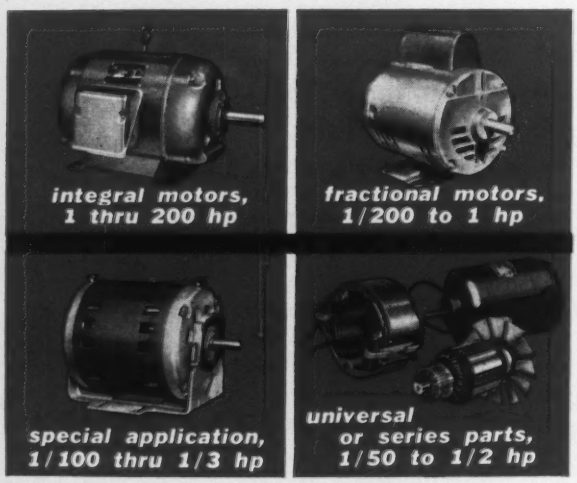
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Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

New Credit Agency May Be Formed

Continued criticism of the Export-Import Bank's export credit guarantee policy may lead to formation of a private credit guarantee agency supported by the government.

This type of agency is sought by U. S. businessmen. It became evident in hearings before the Senate Commerce Committee that exporters were dissatisfied with present programs.

For instance, Francis X. Scafuro, chairman of the National Coordinating Committee for Export Credit Guarantees, a group of 250 major U. S. exporters, recommended that Congress charter a corporation under Federal control but operated with private capital. The corporation would act as a central agency to provide credit risk insurance to all exporters.

The Senate committee, headed by Sen. Warren G. Magnuson (D., Wash.), held hearings on the bank program and U. S. exports in general. The hearings were part of Sen. Magnuson's plan to see the guarantee system was properly overhauled.

Canada Cuts Tax On Automobiles

The cost of an auto in Canada has dropped.

The lower price tag was delivered when Canadian Finance Minister D. M. Fleming pushed through a repeal of the 7½ pct luxury tax on cars. The tax had been in effect since World War II.

In his annual budget message last week, Mr. Fleming called the tax "a serious drag" on Canadian new car sales. He estimates the change will cost the Federal treasury $55 million by the end of the year. But he feels the reduced prices will attract auto buyers and aid in cutting unemployment.

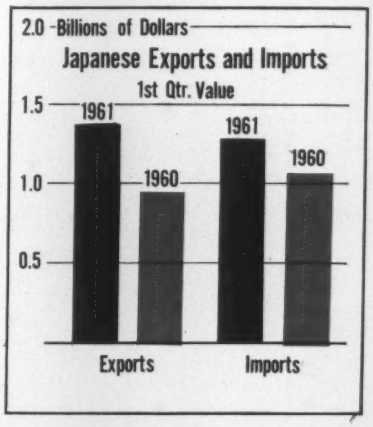
FLEMING: A serious drag.

Canadian car production is lagging behind last year. Through January, 170,000 of 1961 model cars had been turned out compared to 198,000 in the 1960 period.

Imports to Japan Exceed Exports

The Japanese economy continues to grow.

During the first quarter this year, Japanese industrial production, imports and exports all gained (see chart). But a significant fact is that imports during the first quarter climbed higher than exports.



Also, a decline was noted in Japanese output of iron and steel, nonferrous metals, machinery and numerous other items. Production gains came in Japan for copper, aluminum, and electronic products.

As seasonally adjusted, inventories of finished Japanese goods rose 4.5 pct in the first quarter.

Japan's exports through March reached a value of $1.04 billion, a gain of $56.3 million over the same period in 1960. Imports were valued at $1.32 billion. That's $193 million more than in the first quarter last year.

AM Expects More Foreign Business

American Motors Corp. expects to boost international automotive and appliance sales 20 pct next year. This is the prediction from R. D. Chapin, Jr., AM executive vice president.

"Based on Canadian activity and export programs now in effect, total sales outside the U. S. will top $100 million in 1962 compared with $85 million this year," says Mr. Chapin.

He says the increase will be largely the result of AM's expanding participation in the world auto markets.

U. K. Auto Sales Up

It was just a few months ago that British automakers were suffering from a recession (IA—Feb. 2 '60, p. 13). Now auto sales are booming in the United Kingdom.

Auto purchases in May, registered with England's Hire Purchase Information, climbed to 99,000. This is within striking distance of the record levels hit in the spring of 1960. Many British automakers look for new records to be set by auto buyers this summer.

HOW TO MEASURE A NOISE YOU CAN'T HEAR

Vibrations detected by a sensitive pickup, then amplified and analyzed by electronic equipment, enable SKF engineers to measure almost imperceptible noises occurring in rotating ball and roller bearings. Based on long-continued investigation, noise and vibration appear to be almost solely the result of minute deviations in the surface geometry of the rolling elements and rings. Detection of this surface "waviness" as a source of bearing noise is an important SKF contribution towards solving the problem of producing quieter, smoother running bearings. Methods developed for minimizing waviness have already resulted in the quietest bearings yet made for electric motors and other equipment, as well as even greater precision in the high quality bearings for aero-space and similar applications.

Advanced research is one of the reasons why SKF maintains its leadership in producing finer rolling contact bearings. Whatever bearings you need—ball, cylindrical roller, spherical roller, tapered roller or precision miniature types – you'll find SKF your assurance of dependable performance. SKF Industries Inc., Philadelphia 32, Pa.

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SKF MOTION ENGINEERING

Advanced ball and roller bearing technology

Salvage With Sound Waves

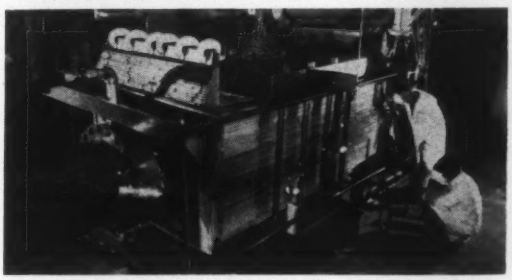
Sound waves are salvaging equipment damaged by smoke and salt water in last December's fire on the aircraft carrier Constellation. Tiny bubbles, formed then exploded by sonic-pressure waves, clean away all dirt. Fire damage to the carrier, originally put at $78 million, is now estimated at $48 million. Rehabilitation of the ship is expected to be completed by next December.

Automates File Searching

In the near future, the current picture of millions of file clerks in industry and government searching endlessly for pieces of paper may change drastically. The National Bureau of Standards has developed an electro-mechanical searching device that automates this work. This "peek-a-boo" system uses punched cards. These data cards will decentralize document storage.

Efficient Generator

With 25 tons of iron-pole pieces and 22 tons of copper plates, an experimental magnetohydrodynamic generator turns out 205 kw of power. Its huge copper-and-iron electromagnet forces



PLASMA GAS: Yields 205-kw power.

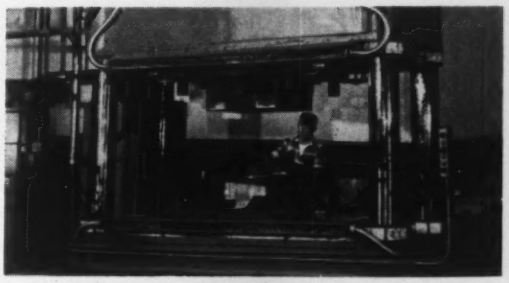
a stream of ionized gas out a tiny gap. This flowing gas, in plasma form at 5000°F, replaces the rotating armature used in conventional power generators. Look for a 20 pct efficiency gain.

How to Beat Competition

Proposed by a leader in the machine-tool field is a new approach to basic research for small companies. This spokesman suggests that companies with similar interests—such as grinding-wheel makers and grinding-machine builders—form common research groups. By contributing a percentage of gross sales dollars to a general, forward-looking program, industry can keep ahead of foreign competition and meet future needs.

Hot-and-Heavy Squeeze

Electrically-heated platens provide a hot-and-heavy squeeze in forming superstrength plastics. Designed to Lockheed Aircraft Corp.'s specs by the Erie Foundry Co., a new hydraulic press generates 1000°F platen temperatures and 1000-



HEAT AND SERVE: No dies needed.

ton pressures. With an 8-ft stroke, it molds newly-developed compounds in the epoxy, silicon, phenolic and cermet groups. Extra-high platen heats allow the press to form flat slabs from 100-200 layers of material without using any dies.

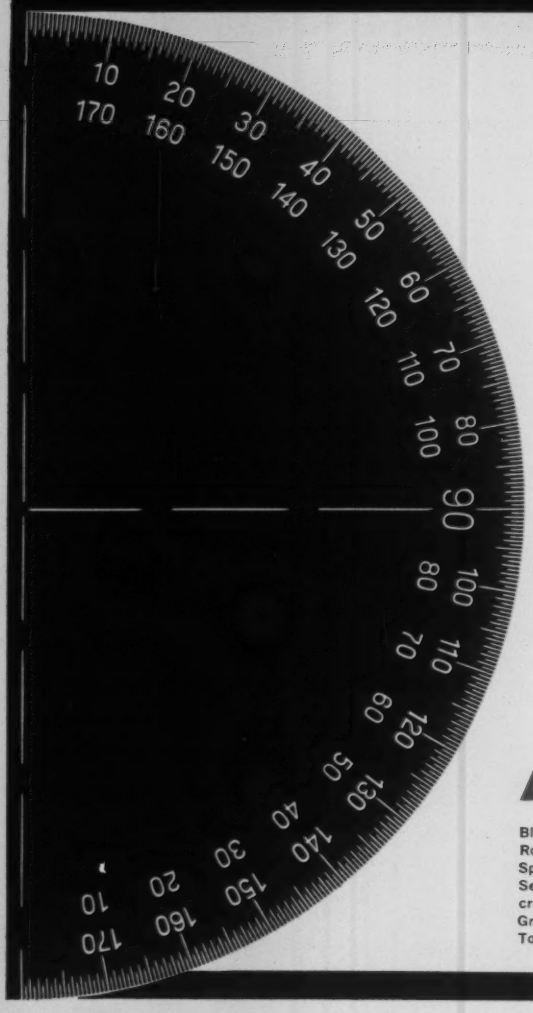
Reduces Titanium Costs

A new process yields 90-pct pure titanium briquettes. This chemical-mechanical compression process also eliminates the need for titanium sponge. By using an all-chip briquette, as opposed to a chip-and-sponge briquette which is three times as costly, overall ingot costs tumble.

Shapes Concrete or Steel

High-pressure liquid streams enable a new lathe to drill and slice various materials ranging from concrete to Inconel X. Constant stream pressures speed slicing. High-frequency pulsations handle drilling. Concrete shaping is done at 2800 psi. Ferrous metals call for 4500-7500 psi pressures. Optimum stream pressure for aluminum is 10,000 psi. Stainless alloys and Inconel X require about 90,000 psi.

"to help an industry engineer and develop new products and new techniques for the benefit of users is part of our responsibility as a supplier of equipment"



The basic metals industry, like most industries, is always in a stage of development. New ideas and new products must be developed to stay ahead or even abreast. This means hard work, man-hours, and money.

If a supplier is to remain a first source supplier to the industry he serves, he must also be willing and able to supply some of his own man-hours, hard work, and money for the good of the industry from which he derives his business.

We have many projects in our confines at this time on flat rolled, pipe and tube, and cold draw. We are spending our own time, effort, and money to help bring the new ideas and the new products to the surface.

Why shouldn't we? The steel industry and the non-ferrous industry have been good to us in our many years in business.

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Top Honors

Sir—My sincerest congratulations on the selection of Tom Campbell, IRON AGE Editor-in-Chief, as the National Management Assn's Free Enterprise Writer of the Year. Living the biggest part of my life near one of the steelmaking centers of the world, I am well acquainted with your publication and particularly the editorials that have appeared in the past.

You are not only well acquainted with the many problems that have and are facing industry and our business system, but you have done something about them. Mr. Campbell's constructive comments to management people have been particularly stimulating. His policy of guided thinking, rather than to merely report or to follow has gained Mr. Campbell and your magazine an outstanding reputation.

This is the first time, by the way, that a representative of a business publication has won this award.

On behalf of the NMA national board of directors and the 65,000 members we represent, may I again offer congratulations.—L. Fred Magruder, president, The National Management Assn., Dayton, O.

Quick Reaction

▪ The June 1 issue of The IRON AGE carried an article entitled "How Quick Reaction Capability Speeds Product Development." Hundreds of readers have written concerning this article. Some of the comments follow.—Ed.

"I find The IRON AGE indispensable. This article is an example of why this is true."—W. W. Bigelow, A. O. Smith Corp., Milwaukee; "I read this story with great interest and found it of real value."—E. M. Schaefer, Hammond, Ind.; "I thought the article on quick reaction capability was very good and would like some reprints."—J. D. Quinn, Haveg Corp., Wilmington, Del.; "Your recent article was very interesting and very timely. Three reprints would be appreciated."—James H. Flanders, Jones & Lamson Machine Co., Springfield, Vt.

Amazed

Sir—I am continually amazed at the evidence of sources of news which are manifested in "Techfront." The continuing reference to new materials, methods, and equipment reflected in "Techfront" are a most interesting contribution in The IRON AGE.

On p. 15 of the June 8 issue, there is an item pertaining to carbide knives shave rod. Can you give further information about this method?—C. H. Hannon, metallurgical engineer, General Electric Co., Pittsfield, Mass.

▫ For further information on this method write to Ferroquip Corp., 27-11 41st St., Long Island City 1, New York.—Ed.

Correction

Sir—In reading the article entitled "Shell Coring Castings Grow," June 8th edition of The IRON AGE, we were surprised to find the statement that "possibly half of these (referring to pearlitic malleable iron crankshafts for the Pontiac Tempest, Oldsmobile F-85 and Buick Special) are purchased from independent foundries."

Actually, Central Foundry Division of General Motors is the only foundry in the world successfully mass-producing cast pearlitic malleable iron crankshafts for automotive engines and is the sole supplier of such crankshafts for the Pontiac Tempest, Oldsmobile F-85 and Buick Special as well as other General Motors cars and trucks.—F. C. Hammer, Central Foundry Division, General Motors Corp.

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Facts in Catalog 10. Posen & Kline Tube Company, Inc., Box 549, Norristown, Pa.

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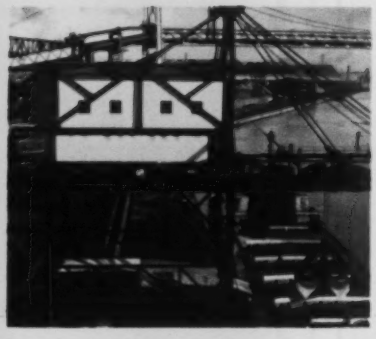
How Dravo serves the steel industry

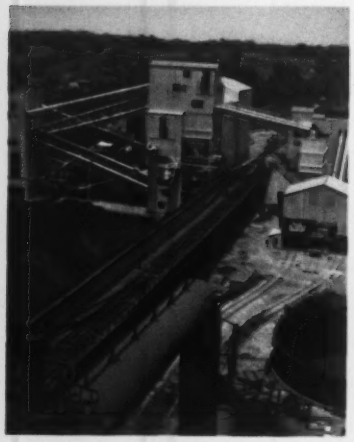
MATERIALS HANDLING EQUIPMENT

New 1650-ton-per-hour unloader and a companion ore bridge rated at 1360 tph speed ore handling for midwest steel producer. Check the coupon at right for details on Dravo bulk materials handling equipment for mills, plants or docks.



ORE PROCESSING

Over 45% of sinter capacity added by U.S. steel industry in last 5 years has been furnished by Dravo—including this 2400-ton-per-day plant. Check and mail coupon to obtain more information on sintering, briquetting, pelletizing and ore beneficiating plants.



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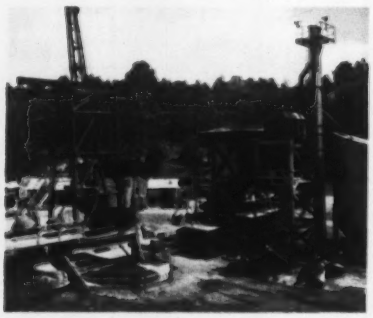
Head frame (left foreground of photo) sits astride 575-ft. concrete-lined ventilating shaft at a steel company mine. Construction of shafts, slopes, tunnels, docks and harbors are part of Dravo's half century of experience in special construction. Mail coupon for information.



Dravo furnished ore unloader, ore bridge and sinter plant for this midwestern steel producer.

PLANT UTILITIES

When completed, this modern intake and pumping station will handle up to 30 million gallons of water daily. Such Dravo turn-key projects include oxygen, power and boiler plants, compressor stations, other special utility and plant facilities. Mail coupon for information.

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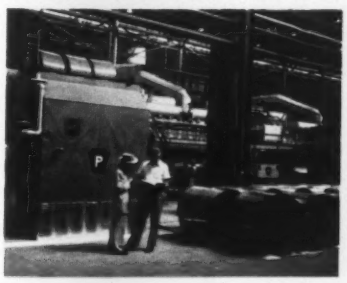
One of 60 Dravo space heaters which supply comfort heating in this large strip mill. Over 20,000 units (¼ to 3 million btu) are in use throughout industry for all types of manufacturing and warehousing structures. Check and mail coupon for details.



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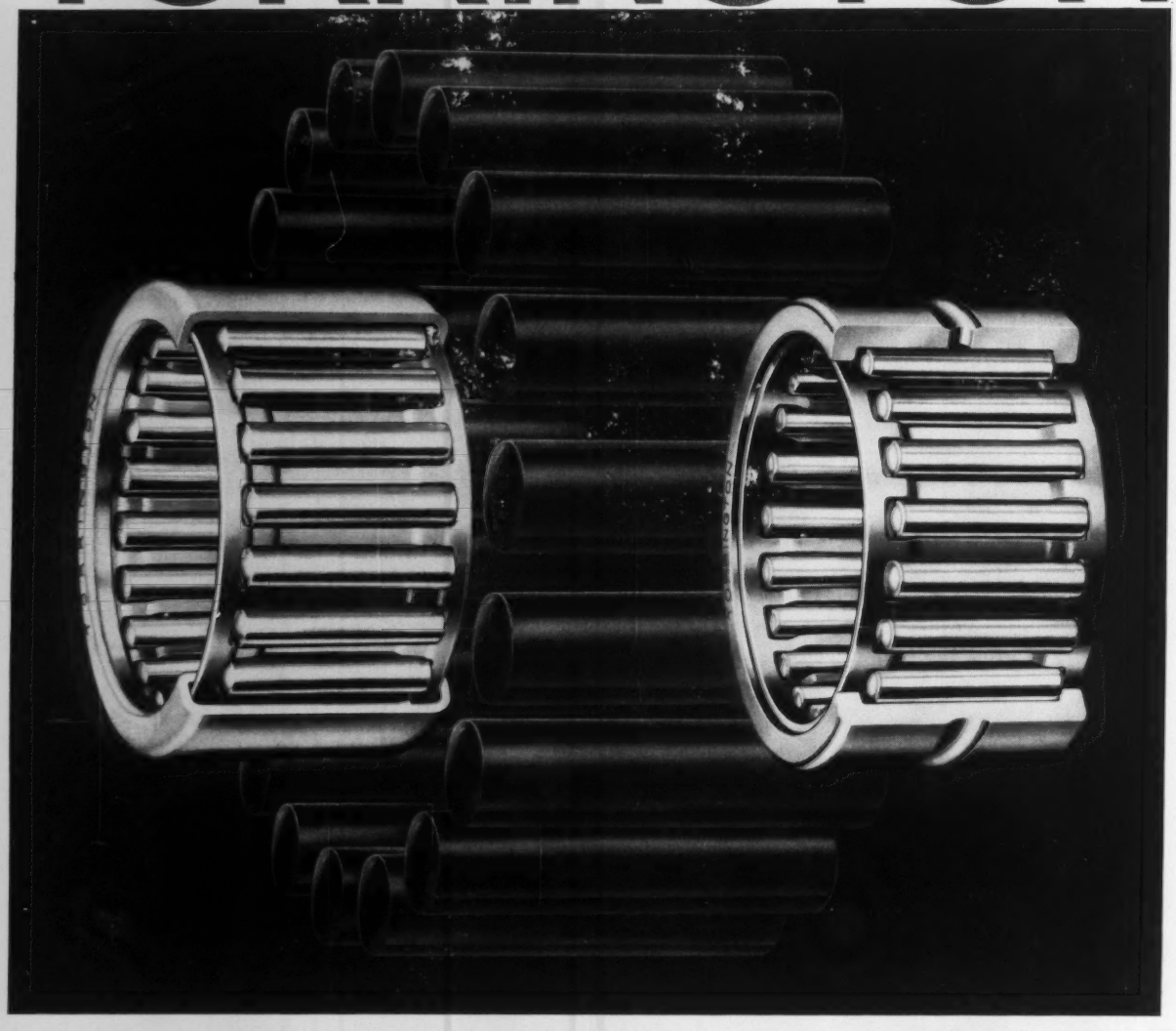

WHATEVER THE DUTY...TORRINGTON HAS A BEARING FOR IT

Take these two bearings:

The unique Torrington Drawn Cup Roller Bearing opens new design possibilities in alternators, power-tool motors, electric mixers, vacuum cleaners and a host of similar products. It is so light, compact and efficient that designers have more flexibility than ever before. Yet the Drawn Cup Roller Bearing costs less than any other anti-friction bearing of comparable performance. In many cases, armature bearing costs have been reduced as much as 50%.

The Torrington Heavy Duty Roller Bearing is ready when the going is tougher. Controlled Contour rollers insure uniform loading and prevent stress concentration at the roller ends. A patented flange-riding retainer insures positive roller guidance and provides ample lubricant storage area. Torrington Heavy Duty Roller Bearings have proved highly successful in two-cycle engines, hydraulic pumps, oil-field equipment and transmission systems.

These are just two examples of Torrington's outstanding capability in bearing design and manufacture. Remember that Torrington makes **every** basic type of anti-friction bearing . . . can supply the bearing that's **exactly** right for your application. Don't hesitate to call us for advice.

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THE TORRINGTON COMPANY

TORRINGTON BEARINGS

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Benefits for Everyone

One of our favorite and continuing metalworking news stories is the battle for the metal can market. The antagonists: Tinplate and aluminum.

We have covered this struggle for several years, reporting aluminum's advances (and some retreats) into the different segments of the can market.

Frozen Juice—The competition is now hottest in one area, the frozen citrus can market. This market was entered with a frontal assault by aluminum and the steel industry retaliated with a new product, thin tinplate.

This week, the battle is in pricing and marketing, with both products manipulating their prices, sometimes in moves hours apart. If you turn to p. 35, Pittsburgh editor G. J. McManus relates latest steps in this knockdown, dragout battle.

Everyone Benefits—The byproducts of the battle have been tremendous capital outlays for facilities to make the material. Millions of dollars, for example, have gone into lines to make thin tinplate. Other outlays have been made for aluminum and canmaking facilities.

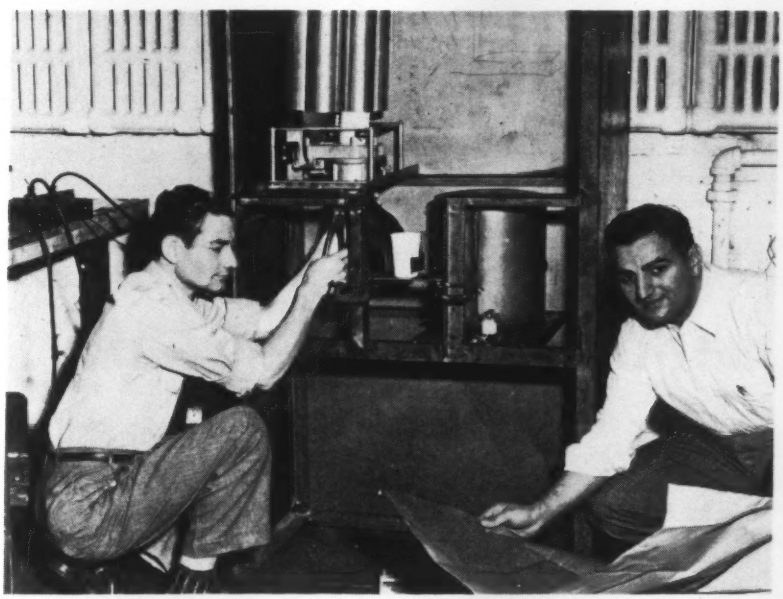
There is, of course, some danger in cutthroat price cutting. But we're confident the competitors will end up with products and operations that will show a profit. And who will benefit? A long list ranging from the housewife, with a more inexpensive, easier to handle container, to the makers of giant capital equipment.

Time for Coffee

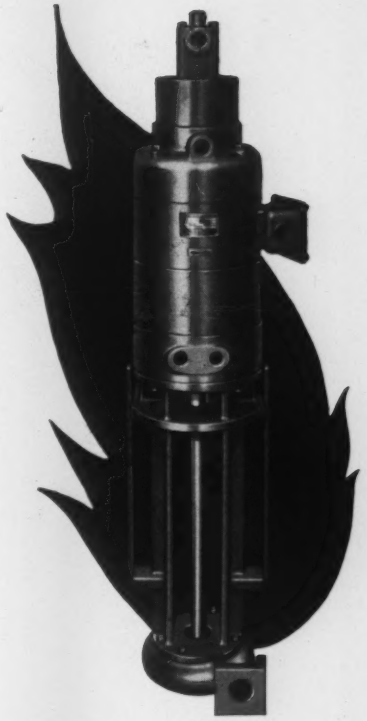
Vending machines have come of age, as a service industry and as a growing metalworking market.

In reporting the story of this industry, we were attracted by a picture, below, of one of the pioneer machines, a 1946 coffee machine.

The men in the picture and the machine have changed since then and you'll be interested in how they and others have built up a big, new industry story is on p. 40.



MODEL T OF COFFEE MACHINES: Lloyd K. Rudd (left) and K. Cyrus Melikian cashed in on the coffee-break from this beginning in 1946.



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Gusher Molten Metal Pumps are tested under operating conditions and have proved that they will give efficient performance under recommended temperatures and conditions of operation. Models 15028E and 15028XE are suitable for temperatures up to 1000° F. Model 9075M with or without closed water jacket for temperatures up to 750° F. Other models from ¼ HP to 10 HP. Write for information and illustrated folder.

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Thread rolling a sucker rod. The coolant: Gulfcut Heavy Duty Soluble Oil. It helps Liberty produce an unusually fine thread.

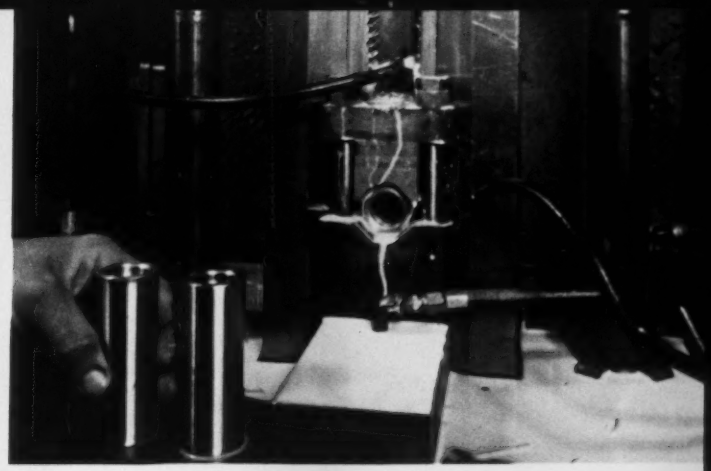
Change to Gulfcut® Heavy Duty Soluble saves thousands of dollars yearly...

Liberty Manufacturing Company has a certain distinction in the oil industry. This Fort Worth, Texas, firm was the first to market ½-inch sucker rods—used in oil wells to actuate the pumps which bring oil to the surface.

Some months ago, the company switched from a chemical coolant to Gulfcut® Heavy Duty Soluble Oil—and eliminated a costly degreasing operation. Previously, degreasing was necessary before sucker rods could receive a coat of protective paint.

"We use a ratio of 20 parts water to one part oil," says Mr. W. V. Barbee, Plant Superintendent. "The result: a light film of oil. It protects the rods against rust, yet isn't heavy enough to make us degrease before painting.

"We've benefited in other ways from the change-over. For instance, we haven't found one bit of rust in any machine-operated part. Paint peeling is no longer



Slotting a 5/8" couplet which fits on the end of a sucker rod. Gulfcut Heavy Duty Soluble Oil is the coolant.

W. V. Barbee, left, Plant Superintendent, and Frank Mauro, Gulf Sales Engineer. In background is stack of sucker rods.

Oil eliminates degreasing operation, GULF MAKES THINGS RUN BETTER!

a problem. And tool life seems to be much improved.

"Lastly, poorly rolled threads on sucker rod pins can lead to real trouble—broken joints out in the oilfields. But Gulfcut Heavy Duty Soluble Oil helps us get an almost perfect thread."

If you've got a tough machining problem, give us the opportunity to show you how Gulf makes things run better! Call a Gulf Sales Engineer at your nearest Gulf office. Or write for Gulfcut literature.

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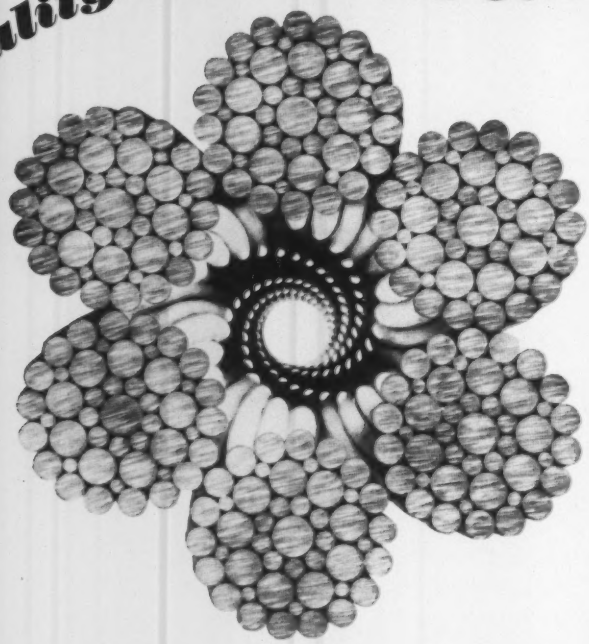

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You get a lot of work out of it

COMING EXHIBITS

Western Plant Maintenance & Engineering Show—July 18-20, Pan Pacific Auditorium, Los Angeles. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

National Chemical Show—Sept. 5-8, International Amphitheatre, Chicago. (Chicago Section, American Chemical Society, 86 E. Randolph St., Chicago 1.)

Industrial Building Exposition — Sept. 25-28, New York Coliseum.

MEETINGS

JULY

Cast Iron Pipe Research Assn.—Annual meeting, July 26-27, Seaview Country Club, Absecon, N. J. Assn. headquarters, Prudential Plaza, Suite 3400, Chicago.

AUGUST

American Astronautical Society—Fourth western regional meeting, August 1-3, Sheraton-Palace Hotel, San Francisco.

Personnel Management Conference—Cornell University's New York State School of Industrial and Labor Relations, August 1-4, Ithaca, New York.

Metallurgical Society of AIME—Semiconductors conference, Aug. 30-Sept. 1, Ambassador Hotel, Los Angeles. Society headquarters, 29 W. 39th St., New York.

SEPTEMBER

Air Moving and Conditioning Assn., Inc.—Annual meeting, Sept. 10-14, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, Guardian Bldg., Detroit.

International Industrial Conference—Sept. 11-15, Masonic Memorial Auditorium, San Francisco.

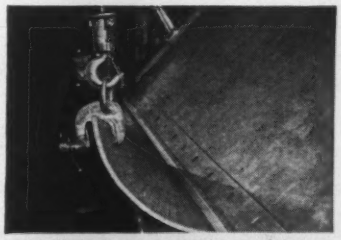
(Continued on P. 28)

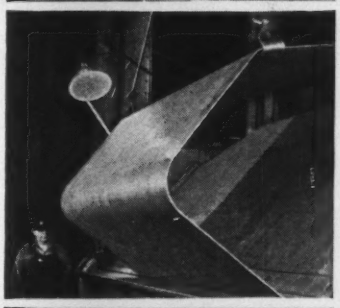
Bending Steel Plates for WELDMENTS?

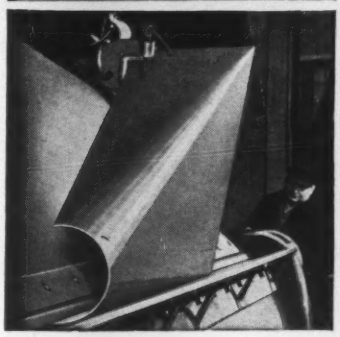
do it economically with

CHICAGO® POWER BENDING BRAKE

(no dies needed)





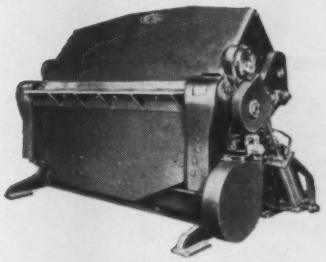


The accompanying illustrations give an idea of the versatility of the CHICAGO bending brake. No dies have to be changed or adjusted—no dies are used on these jobs. Yet, duplication is easily obtained on successive pieces. The machine is quickly adjustable for different thicknesses of material up to rated capacity. Automatic stop regulates the angle of bend. This, too, is adjustable to any degree of bend. The ease of changing from one job to another and the elimination of die costs make the CHICAGO bending brake the economical method for bending steel plates for weldments.

Many standard sizes are available with capacities for bending mild steel up to 12 feet by ¾ inch or 16 feet by ½ inch. Also many standard sizes in hand and power operated models for sheet metal.

BULLETIN P-55
This bulletin gives the details of how these and many other jobs are handled. Also complete description of the machine and specifications of the standard sizes.
Ask for a copy.

Front view of one of the heavy duty models of CHICAGO power bending brake showing the operation end of the machine.



Recommendations for any job on request.

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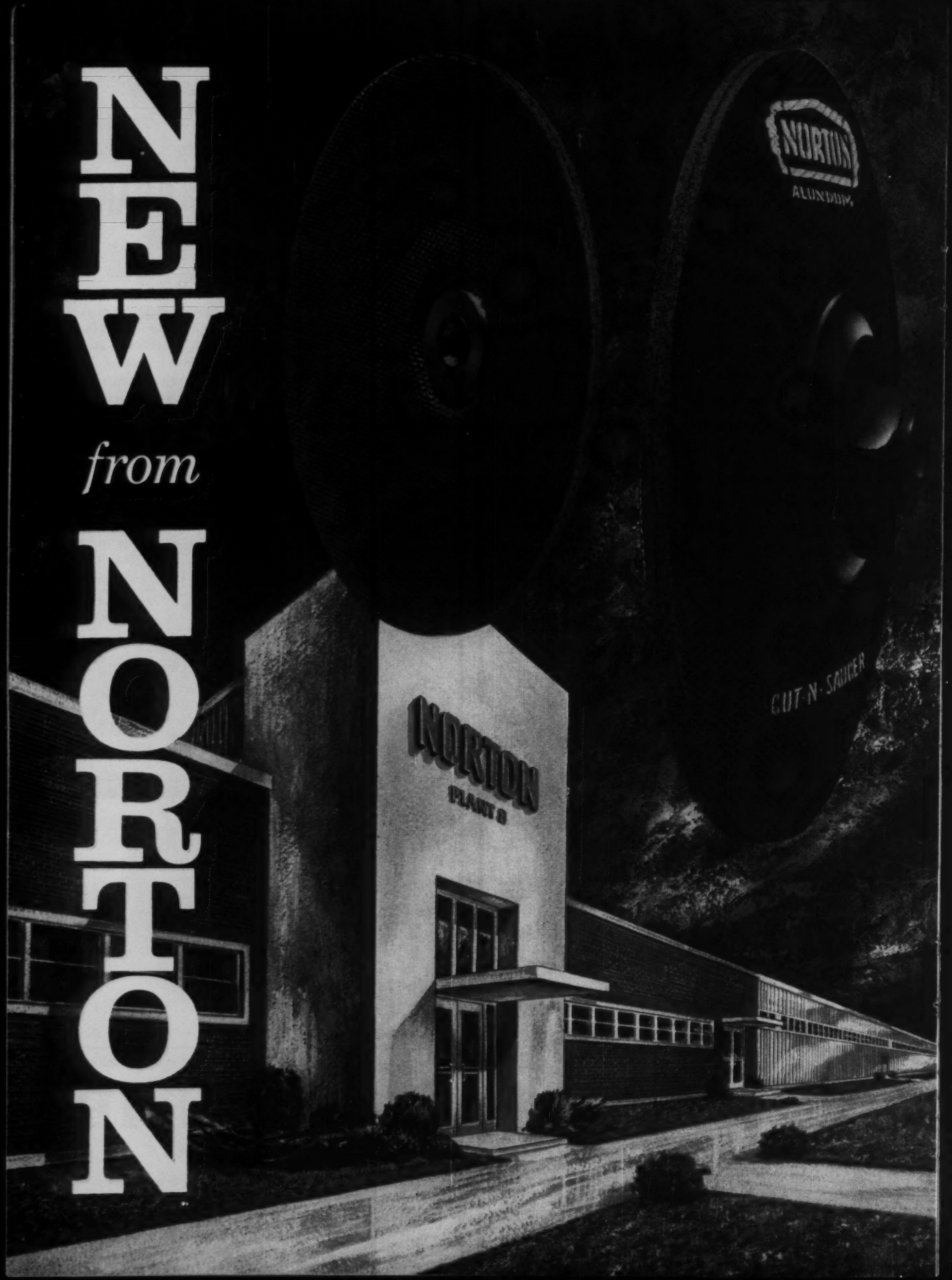
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A new combination from Norton's newest plant

For easier, faster weld-grinding, light snagging and many other portable grinding jobs, Norton now offers you:

The only reinforced wheels that combine a saucer shape with a disposable mount.

These are the new BSA Type Cut-N-Saucer wheels with Dis-Card mounts . . . available in 7″ and 9″ diameters. They are produced in the big new Norton Plant 8, built specifically to improve the manufacture and performance of resinoid wheels.

Reinforced with layers of fibre glass, BSA Cut-N-Saucer wheels gain added advantages from the new shape. Compared with straight wheels, BSA wheels on the job can be held at angles much closer to the horizontal. Results are easier control and reduced operator fatigue.

The Dis-Card mount is equally new and vital. Unlike ordinary mounts it is no separate attachment. It is permanently secured — designed to be bought and thrown away with every wheel. This means you can change wheels in seconds — completely eliminating "lock washer" action and the usual mounting routine that can take up to half an hour. So every Cut-N-Saucer wheel you buy is already mounted — and *stays* mounted, throughout wheel life.

Yet you pay no more for a Norton Cut-N-Saucer than for a conventional reinforced wheel!

Cash in on this first opportunity ever offered to you to get advantages never before combined in a single, standard priced, portable grinding wheel. For further facts on the new BSA wheels — or on straight wheels also with Dis-Card mounts — see your Norton Distributor, or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

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W-2017

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OPERATES 24 HOURS PER DAY THROUGHOUT THE YEAR
Low Initial Investment
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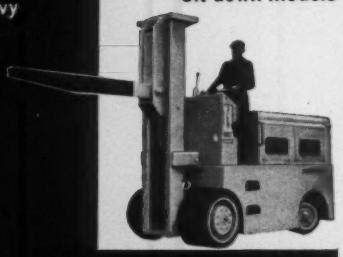
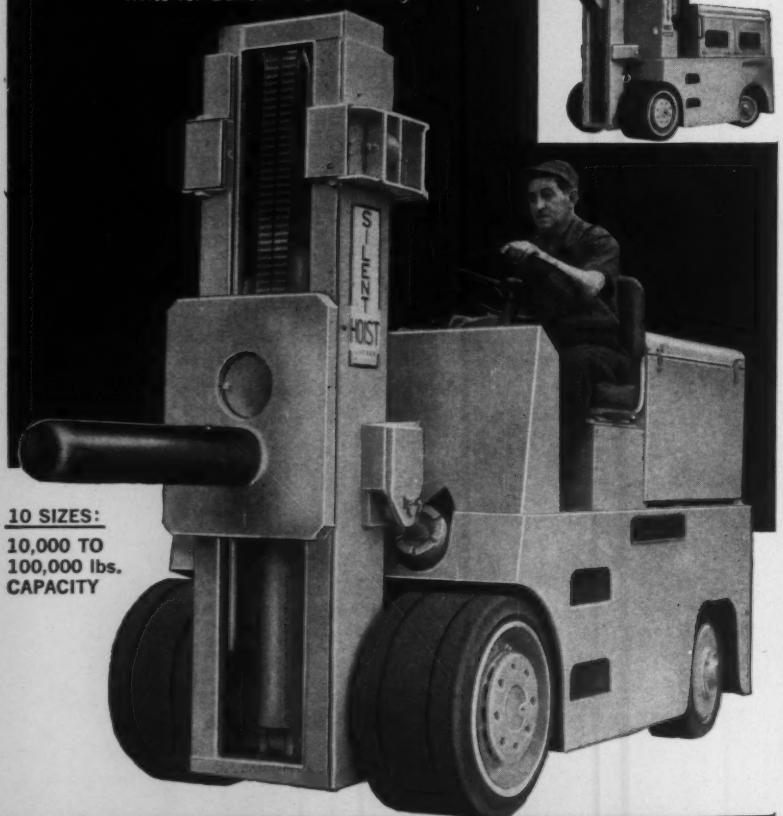

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10,000 TO 100,000 lbs. CAPACITY
SILENT HOIST & CRANE CO. • BROOKLYN 20, N.Y.

MEETINGS

(Continued from P. 25)

Society of Plastics Engineers, Inc. —Regional Technical Conference, Sept. 12, Central Indiana Section, Severin Hotel, Indianapolis.

Non-Ferrous Founders' Society—Annual meeting, Sept. 17-21, Shawnee Inn, Shawnee-on-the-Delaware, Pa. Society headquarters, University Bldg., 1604 Chicago Ave., Evanston, Ill.

AEC Welding Forum — Annual meeting (classified), Sept. 20-22, Southwest Research Institute. Institute headquarters, Granada Hotel, San Antonio, Texas.

Industrial Electronics Symposium —Sept. 21-22, Bradford Hotel, Boston. Institute headquarters, 51 East 42nd Street, New York 17.

Pressed Metal Institute — Annual meeting, Sept. 24-28, The Grand Hotel, Point Clear, Ala. Institute headquarters, 3673 Lee Rd., Cleveland.

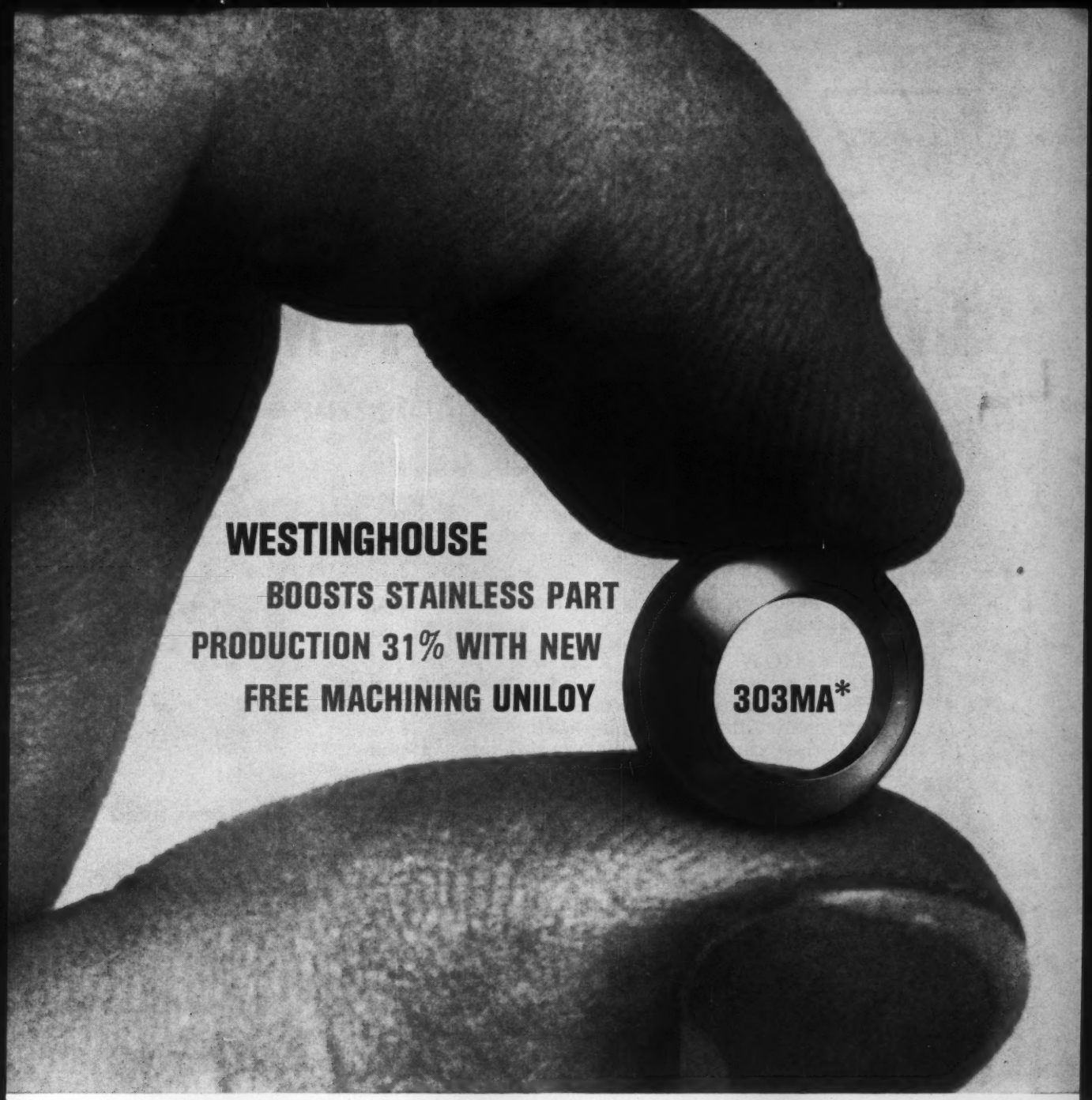
American Welding Society — Fall meeting, Sept. 25-28, Adolphus Hotel, Dallas, Texas. Society headquarters, 33 W. 29th St., New York.

Assn. of Iron and Steel Engineers —Annual convention, Sept. 25-28, Penn - Sheraton Hotel, Pittsburgh. Assn. headquarters, 1010 Empire Bldg., Pittsburgh.

American Die Casting Institute Inc. and The Die Casting Research Foundation—Annual meeting, Sept. 27-28, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

American Production and Inventory Control Society—Annual national conference and technical exhibit, Sept. 28-29, Pick-Congress Hotel, Chicago. Society headquarters, 330 S. Wells St., Chicago 6.

Purchasing Agents Assn. — 14th Pacific Inter-Mountain Conference, Sept. 29-30, Westward Ho Hotel, Phoenix, Arizona.



The Westinghouse Standard Control Division at Beaver, Pa., compared New free machining Uniloy 303MA* stainless steel with regular Type 303. The part—a close tolerance spring end support for circuit breakers and control equipment—was machined from ½-inch stock. Here are the production line results:

	AISI Type 303	New Uniloy 303MA
Spindle Speed	890	1180
Surface Ft. per Min.	115	155
No. Pieces per Hour	110	144
Tool Life	Form tool sharpened 3 times every 8 hours	Form tool sharpened once every 6 hours

New Uniloy 303MA also machined cleaner and smoother to produce higher quality parts. It is now specified in all applications formerly calling for Type 303 stainless steel at this plant.

Cut *your* production costs! Order New Uniloy 303MA at your nearest Universal-Cyclops steel service center or sales office. Ask for your copy of the "Uniloy 303MA" brochure.

*U.S. PATENT NO. 2,900,250

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STEEL CORPORATION
EXECUTIVE OFFICES: BRIDGEVILLE, PA.

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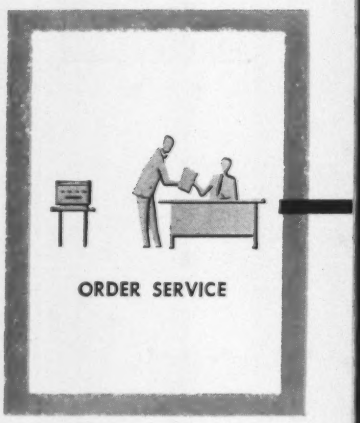
INTEGRATED AUTOMATION

for management control of your entire plant

Sharp increases in domestic and foreign competition, fluctuating market demands, and today's general profit squeeze call for operating decisions which will have an immediate and profitable effect on products, costs, and mill utilization. General Electric's step-by-step concept of Integrated Automation provides management with the soundest means of achieving this aim with a minimum of initial capital expenditure.



HERE'S HOW INTEGRATED AUTOMATION WORKS. You begin with an over-all program designed to automate your individual processes—whether new or old, large or small. After establishing these "Islands of Automation" they can be logically grouped into automated production areas. Each process receives direction from a General Electric Area Control System which provides continuous direction and monitoring of not only each area process but their inter-relationships as well. Finally, these automated production areas can be linked by General Electric's advanced Industrial Information Handling System to provide automatically integrated direction and control of corporate functions common to all plant areas.

COMPLETELY AUTOMATIC order service, production scheduling, and manufacturing throughout your entire plant will result. Over-all plant performance will be in direct and immediate accord with management decisions based on incoming orders, related process operations, materials inventories and all of the many complex variables that determine profitable plant operation—*scientific management that takes guesswork out of decision-making.*

LET GENERAL ELECTRIC BEGIN WORKING with you now in your planning for future profits. Begin by calling your nearest General Electric Sales Engineer, or write for your newly revised copy of GEA-6939A, "Guidebook To Automation," General Electric Company, Section 659–07, Schenectady 5, New York.

FROM ONE SOURCE

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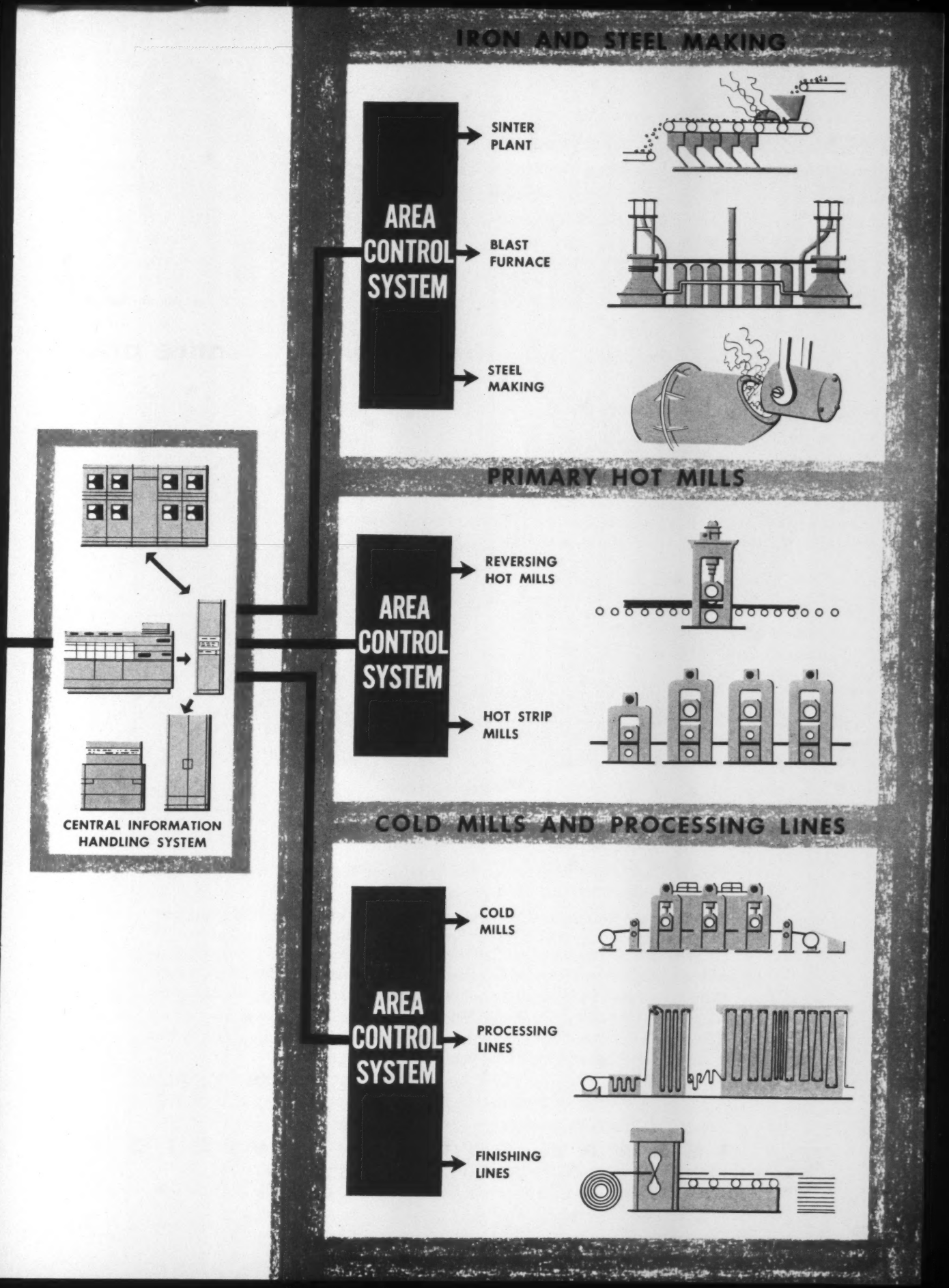
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HOT STRIP MILLS
COLD MILLS AND PROCESSING LINES
AREA CONTROL SYSTEM
COLD MILLS
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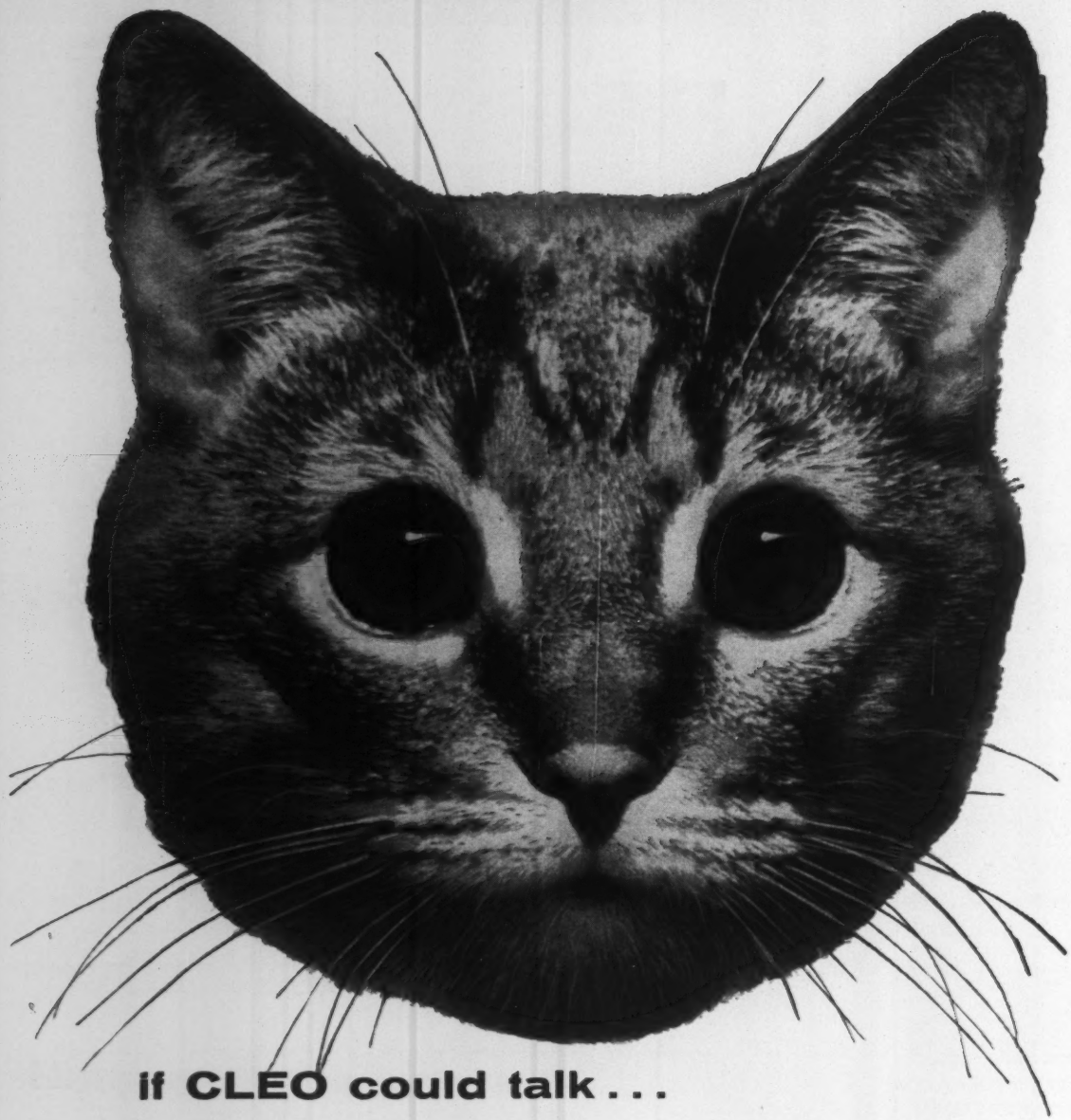
FINISHING LINES
CENTRAL INFORMATION HANDLING SYSTEM



If CLEO could talk . . .

This is Cleo, a cat who makes her home near the secure warmth of our billet furnace.

Cleo is an eye witness to almost every operation in our plant. Day and night, she sees the relentless effort of our "men of steel" to produce steel of quality . . . men who are qualified not only by years of experience in the production of high quality steel for cold heading and nut formations, but also by a keen CONSISTENT interest to maintain quality . . . and to give every order, regardless of quantity, the *same* special attention.

There are a number of sources for bars and rods, but if CLEO could talk to YOU . . . you'd call Seaway next time you order!

Ask us about a delivery date on your next order!

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SEAWAY STEEL DIVISION

ROBLIN - SEAWAY INDUSTRIES, INC.

101 EAST AVENUE • NORTH TONAWANDA, NEW YORK

POOR PERFORMANCE BY MARKETING MANAGEMENT has been scored by E. J. Green, vice president of Westinghouse Air Brake Co. He calls for a "managerial revolution" that will provide: Better decision-making data, "responsive" marketing strategy and tactics, more innovation in products and market services, and development of marketing manpower to carry problems to a successful and profitable conclusion.

FABRICATED STEEL PRICES--steel prices charged on construction jobs involving fabrication of bridges, buildings and highways--are still low. Some contracts have gone for 13¢ a lb and lower, not too far above quoted price of structurals. This is in the face of increased construction spending. Competition is especially rough in the East.

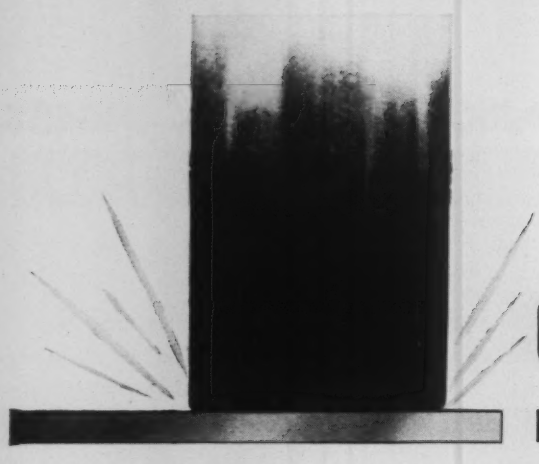
THE BIG MARKET OVERSEAS is centering more in Western Europe. Last year, U. S. exports to W. Europe jumped 41 pct to a record value of $6.8 billion. Almost 40 pct of all U. S. exports of metalworking machinery and machine tools went to W. Europe last year.

STREAMLINED MARKETING is one aim of the merger of the Plymouth and Chrysler-Imperial Divisions of Chrysler Corp. The corporation now has two marketing divisions, Dodge and Chrysler-Plymouth.

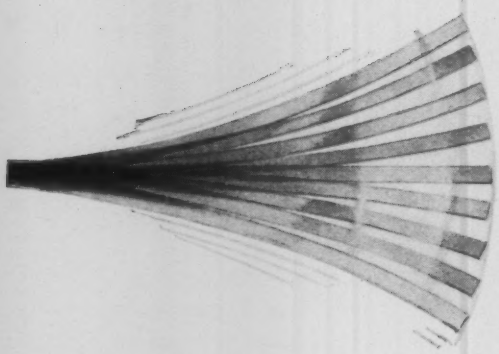
COMPUTER SALES FOR INDUSTRIAL USES are on the upswing, says the investment service, Value Line. It reports the industry expects 1961 sales of numerically-controlled machines to reach $50 million, 10 pct of computer sales. Sales of numerically-controlled machines have doubled in each of the past three years.

BUSINESS AIRPLANE MAKERS may be jolted soon by stepped-up competition from foreign plane makers. Lured by the lush and growing U. S. market for small private aircraft, several foreign producers are reportedly forming an association to promote marketing of their planes in this country.

FOREIGN CONSUMER PRODUCTS have widespread acceptance in this country. This is a finding of a consumer poll made by Opinion Research Corp. The researchers report that acceptance of foreign products is "likely to increase." Further, "there is little evidence of sentiment to "Buy American," and little effort at the point of sale to push domestic products over imports."



GREATER IMPACT STRENGTH



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You get both in Timken® vacuum arc steel

By eliminating contamination from basic sources in conventional steel melting, the Timken Company can serve you with the cleanest, strongest steel available in commercial quantities.

We start with Timken® electric furnace fine alloy steel electrodes, remelt and solidify them in an air-free, refractory-free, slag-free water-cooled copper crucible, under vacuum of less than one micron. The resulting super-clean, sound and uniform steel is the natural choice for extremely critical parts, such as aircraft or jet engine components.

Timken consumable electrode vacuum arc steel is available in ingots up to 24″ in diameter and weighing up to 10,000 lbs.—and in bars and rotary-pierced tubing in a wide range of alloy and stainless analyses. Let our metallurgists help you on applications for Timken vacuum arc steel, in developing lighter, stronger parts. Call or write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.

TIMKEN®
FINE ALLOY STEEL

Aluminum, Thin Tinplate Battle For Frozen Citrus Market

Price developments follow hours apart as battle develops for frozen citrus market.

Aluminum and steel producers plan new moves in competition for can market tonnage.

By G. J. McManus

INVADING THE FIELD: In-plant assembly gave aluminum a fast start in the frozen citrus market. Scene is at a Minute Maid Florida plant.

■ Price cuts bounced back and forth in the can market last week and there were times when no one was sure who had the ball.

With citrus packers due to say what materials will be used for next season's 1.2 billion cans, container companies and aluminum producers pushed hard for favored positions. The new thin tinplate moved strongly into the picture.

First Blows—The current round started when a major canmaker came out with a price of $18.63 per 1000 for containers with thin tinplate bodies. The recently introduced thin plate is double-reduced to 55-lb thickness for this application. In the past, 75-lb tinplate has been standard for citrus cans.

The move dropped the price of thin tinplate cans $1.80 under the price of cans with aluminum bodies and tinplate ends. Prior to this, there was a small differential between the two and conventional tinplate cans were considerably higher than the aluminum combination.

Time for Decision—Word of the cut came as the packaging committee of the Florida Canners Assn. was preparing to make its recommendation for cans to be used in the fall season. The committee acts as a standards group on private label cans, which total about 750 million.

According to a member of the committee, Reynolds Metals Co. quickly came back with an offer to make aluminum cans available at a price competitive with tinplate cans. This was taken to mean a price of $18.63 per 1000, but no details were given on pricing mechanics or the manner of supply.

In any case, the packaging committee handed down a specification calling for aluminum bodies with tinplate ends. The same recommendation was made last year.

Aluminum Action — At roughly

A Market Worth Going After

In 1960, a total of 4.8 million tons of tinplate was consumed in tinplate cans. Aluminum, just entering the market, accounted for 20,314 tons used in can making. While aluminum isn't likely to hurt the tinplate market seriously this year, these figures show how large the market is for metals in the container field.

Tons of Tinplate Consumed in Cans in 1960

Fruit and Fruit Juices	716,236	Soft Drinks	73,478
Vegetable and Vegetable Juices	825,090	Beer	862,911
Evaporated and Condensed Milk	195,296	Baby Food	50,564
Other Dairy Products	25,037	All Other Foods	488,595
Meat and Poultry	147,569	Pet Foods	186,891
Fish and Seafood	123,929	Oil	245,263
Coffee	214,375	Paint and Varnish	145,313
Lard and Shortening	91,450	Antifreeze	43,098
		Pressure Packing	66,440
		All Other Nonfood	316,269

the same time, Aluminum Co. of America went to can companies with a price of 28¢ a lb for citrus can stock in coils. This was a reduction of more than 2¢ a lb. It put can stock only 2¢ a pound over the price of primary aluminum ingot. Reynolds met the price.

A leading citrus packer said there had not been time to get a full reaction to this latest change. He said it was very possible further developments might make it necessary to review the whole can program.

In-Plant Assembly — According to aluminum men, the initial cut in tinplate can prices was made to keep packers from assembling their own containers. The idea of in-plant assembly has been catching on in recent months. The first body-making machine was installed last August by Minute Maid Corp.

Since then, Winter Garden Citrus Products Cooperative has put in a line. Minute Maid has put in a second unit and another large packer has gone to in-plant assembly. Packers now have the capacity to make 320 million units a year, says Reynolds Metals, which sponsored the program and is supplying aluminum body blanks.

More Price Developments—Aluminum people say the in-plant trend brought a price reaction when it started last year at Minute Maid. They point out the recent reduction in tinplate can prices was made without any change in the price of the raw steel. They point also to the general increase in can prices early this year.

However, the picture is changing so rapidly it is difficult to sort out reasons or even keep track of developments. From the standpoint of volume and experience, thin tinplate was pretty much on a test basis, until recently. Steel mills were providing limited quantities from temporary facilities. Canmakers were working out fabricating bugs.

Facilities Coming—Now, decisive commitments are being made. Last week, National Steel Corp. announced plans for "the first facilities especially designed and constructed for production of light weight tinplate. . . ." A two-stand cold mill, with full cleaning auxiliaries, will enable National's Weirton Steel division to turn out 300 pct more thin tin.

Other mills are wrestling with decisions on similar facilities and some hint they may have already taken the plunge.

Other Developments—Technical and commercial moves are keeping can costs in a fluid state all along the line. National Brewing Co. in Baltimore and Coors in Golden, Colo., have gone to extruded aluminum cans for beer. The largest brewers have been leaning toward in-plant canmaking.

However, the beer people have been holding back to let the dust settle. In the two commercial operations now running, aluminum beer cans are extruded at the rate of 120 a minute. A number of press makers say they can get speeds up and costs down. There has been scepticism about these claims but now a major aluminum producer is installing a press designed to kick out 200 beer cans a minute.

There is also work on high speed methods of welding aluminum seams. Until now, conventional aluminum cans have been used only for low pressure products where a cemented seam was suitable.

Drawn aluminum cans are also getting a big play. Kraft Foods is putting cheese dip in a drawn can supplied by The Central States Can Corp., Massillon, O. Central States is expanding its drawing facilities. The aluminum industry feels it is ready to take over the tuna fish market with a shallow can made by a single stage draw.

How to Open — In the frozen juice market, price is just one of the unsettled questions. Minute Maid is testing a quick-open top developed by Alcoa and another developed by Central States with Kaiser Aluminum & Chemical Corp. Same packer is checking Alcoa's laminated foil can.

Back to Price — However, the burning question right now is price. In the first head-on tangle with thin tinplate, aluminum showed itself willing to meet price competition penny for penny. This may not be the end of the matter. The price cut for tinplate cans was made on a future basis. It does not take effect until Oct. 1, when the new packing season moves into high gear. An aluminum executive wonders what will happen if steel mills should step in meanwhile with a cut in the price of thin tinplate.

Beryllium Supply Is Assured

Producers Expand Capacity, Line Up Domestic Ores

By the end of July, production capacity of beryllium metal will be up to 60,000 lb per month.

And development of domestic ore sources eases worries over availability.

■ Recent developments in the beryllium industry should go far in aiding the long-term outlook for the space-age metal.

Beryllium metal production capacity has been expanded by the industry's two producers. And both have announced tie-ins with domestic ore sources. Currently, most beryl ore is imported from South America and Africa.

Metal Expansion — This week, Beryllium Corp. of Reading, Pa., announced completion of a $3.5 million expansion program at its Hazelton, Pa., plant. Production capacity has been raised to 25,000 lb per month.

Brush Beryllium Corp.'s expanded facility at Elmore, O., goes on stream in July. The company's president, George S. Mikhalapov, says: "We will get three times last year's volume. We should be getting out over 40,000 lb per month."

No Shortage—"There's no shortage of beryllium at the present time," says Lawrence F. Boland, executive vice president of Berylco. "Now that the industry has almost tripled its capacity, the demand for beryllium—from either government agencies or private industry—is not in excess of present capabilities.

"Before the expansion," he continues, "it's true that there were demands for beryllium substantially in excess of capacity. But today that's no longer the case. In fact, at the present rate of consumption, with some projection into the future, the industry's new capacity appears to be adequate for the time being. However, in our own case at least, we have built a certain amount of 'reserve capacity' for the future."

Domestic Ore—One of beryllium's drawbacks has been the fact that producers are almost completely dependent on overseas sources. Consequently, some potential customers have been reluctant to specify the metal in critical defense items.

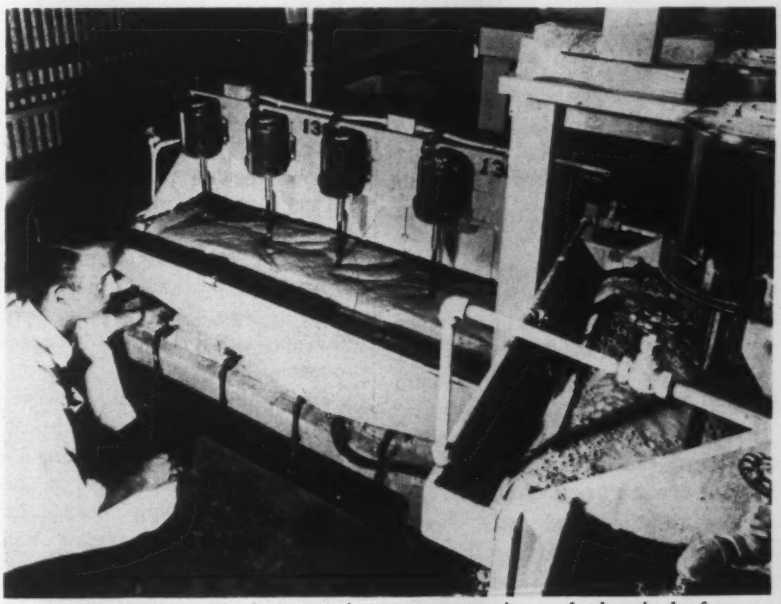
Now, however, the two U.S. producers have each announced that they have secured domestic sources for beryl ore. The sources are located near Delta, Utah. Each uses a different method of obtaining the beryllium oxide from beryllium-bearing clays.

Flotation Process — Beryllium Resources, Inc., 29 pct owned by Brush, recently announced it expects to have its first beryl concentration plant at Delta completed by the end of the year. This company uses a flotation process it developed to raise the metal content of the ore.

"This successful reduction of domestic ores removes all doubt as to the quantity we could produce if we had to," says Brush's Mr. Mikhalapov. "If we had to go to domestic sources tomorrow, we know it could be done — although it would require more capital investment." Use of the Utah deposits would mean construction of an extractor or concentrator near the mines to be economically attractive from the transportation standpoint. It would cost about $1 million.

Thus, Brush's Mr. Mikhalapov says his company plans no large scale transfer to usage of domestic beryl for the present. "Fortunately, we are under no pressure now to make a sudden switch so we can evaluate it more closely," he says.

In Use by Fall—Berylco, however, indicates it expects to be re-



STEADY HEAD: Finely ground ore, water, air, and chemicals form a stable froth in this pneumatic rougher-flotation machine. It is part of the concentration method developed by Beryllium Resources, Inc.

ceiving domestic ore by fall. The company has established a "joint venture" with United Technical Industries of Salt Lake City. It calls for the production of beryllium oxide from a proprietary UTI process.

Beryllium-bearing clays to be used by UTI are acid soluble, "providing an easier and less expensive method for extracting beryllium oxide," the company says.

Marketwise, beryllium's future remains as bright as ever. This, despite the fact it carries a premium price of $75 per lb and up for simple machined shapes.

Steady Growth — "Being completely realistic about beryllium," Berylco's Mr. Boland says, "we see a steady growth over the coming years. But," he says, "any lowering of prices must first await a much broader range of applications than at present."

One development still in the planning stage could change the price outlook: "This is the possibility of using beryllium powder as a solid propellant in rockets and missiles. Such a development could transform the industry into a large-volume business," Mr. Boland explains. However, he cautions that the fuel application "is strictly experimental right now."

Sales Are Up—Even so, Berylco expects its 1961 beryllium metal sales to reach a total of $12-14 million. This would be 75-100 pct higher than 1960's $7 million in metal sales. In 1959 sales were only $3.25 million.

Brush, too, expects higher sales this year. Says its president: "Sales this year should reach about $30-32 million, compared with $28 million last year. Because we were short on capacity in 1960, we haven't been pushing new applications too much lately. But the expansion will change things."

Spread the Word—And Berylco's Mr. Boland sums up the producers' feelings: "We have our capacities pretty well sized up for the immediate future and a bit beyond."

Big Squeeze Is Put On Metals Research

Industry is showing interest in "barogenic machines" to aid in metals and materials research.

These units put materials under ultra-high pressures and high temperatures.
By K. W. Bennett

■ When a "barogenic machine" was quoted at $230,000 last week, a little-known laboratory tool moved into the capital equipment class.

The "barogenic machine" is basically a highly specialized 500-ton press. It will squeeze a thumb-size sample of test material with a pressure of 1.5 million psi—enough to bend atoms out of shape. It can apply this pressure while boosting the temperature of the sample to over 5000°F.

Ultra-High Pressure—The process is called ultra-high pressure generation—UHP.

It's being used to produce commercial industrial diamonds. But there is a rising interest in UHP.

Engineering Supervision Co., which reported the $230,000 inquiry, has shipped 13 ultra-high pressure machines in the 18 months it has been in business. And it has a backlog for 21 more units.

Of 34 machines sold in 18 months, 20 pct have gone to government labs, 30 pct to universities and colleges, and 50 pct to industry.

Most are still used in experiments to study changes in properties of such elements as iron, copper, nickel, cobalt, bismuth, and aluminum, and semiconductor materials, under extreme pressures and temperatures.

Machine Size Grows — Though UPH began in the mid-1930's, industrial interest is new.

Prices for UHP units range from $4500 to $125,000, depending on working pressures and temperatures. Most equipment can squeeze a cube only a little larger than one in. But a press is available that will exert a pressure of 1.5 million psi on a 2-in. cube. And units can be built to put that pressure on a 3-in. cube.

Bigger machines, to compress bigger workpieces, are on the way. A unit capable of handling 2-in. diam. bars can be built.

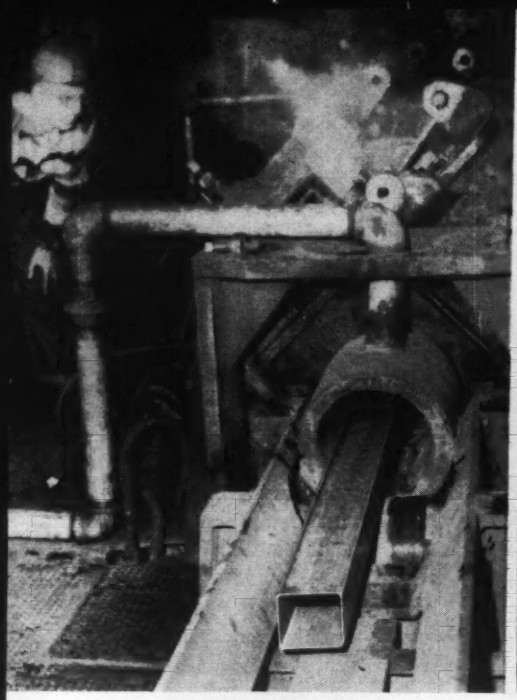
How Many in Use?—The number of UHP machines in the U.S. is unknown. But it far exceeds the number produced by Engineering Supervision. A major independent research lab built five for its own use. Elmes & King Mfg. Co., Cincinnati press builder, rebuilt 15 conventional presses into UHP machines capable of delivering 1.7 million psi. This has been since 1954.

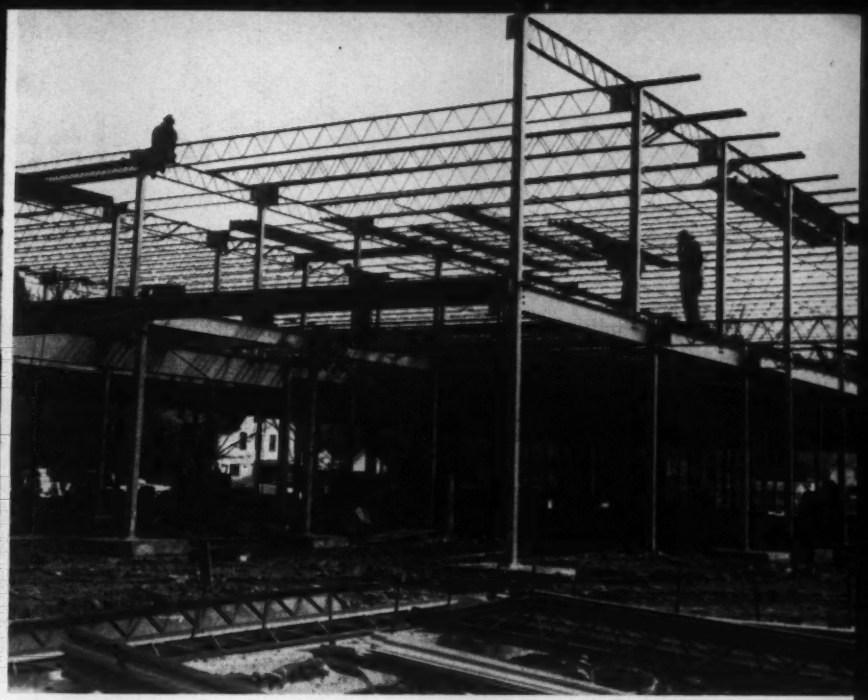
Engineering companies are also building UHP units. At least four offer special 150-300,000 psi machines. And a group of small 60,-000 psi machines are beginning to appear. Technically, these aren't UHP units. But they offer a low-cost piece of specialized equipment to squeeze test samples.

Aerospace Interest—If UHP interest didn't exist two years ago, it does now.

A check of five research labs turned up five UHP projects. And all are scheduled for increases, including delivery of major equipment items to at least two.

It's probable that the government will step up research grants in this area. But experimenting by industry is already strongest in the fields of electronics, chemicals, metals, ceramics, atomics, and missiles and aircraft.





MILL TO CONSUMER: A six-in. square hot-rolled carbon steel structural tube comes from the McKeesport, Pa., sizing mill of U.S. Steel Corp.'s National Tube Div. The 55-classroom Broadway School in Elmira, N. Y., now under construction, is the first user of National Tube's new product.

Structurals Get a New Shape

Tubular products are now officially in the structural field. The idea is not new, but the method is.

The new line is shaped, priced and designed particularly for structural work.

■ Tubular products moved officially into the structural field this week with the introduction of hollow sections by National Tube Div., United States Steel Corp.

The new product line is shaped, priced and designed for structural work. It comes in squares up to 12 in. by 12 in. and rectangles up to 10 in. by 6 in. It is produced as a standard hot rolled product, conforming to specifications for structural steel. It's priced by weight at a level somewhere near conventional structurals.

The idea of shaping tubes into squares and rectangles is not brand new. Van Huffle Tube Corp. is a leading supplier of these products. Republic Steel Corp., Jones and Laughlin Steel Corp. and others have long been active in the field.

However, the product has been oriented toward the mechanical tubing field rather than the structural market to some extent. For the most part it has been made from electricweld tubing. It has been produced to a wide range of special requirements, with sizes restricted by the maximum diameters of electricweld mills.

Like other tubular products, the shaped sections have been priced on the basis of length. They have been sold through pipe jobbers.

But, National Tube's move involves a clear-cut shift in emphasis. The mill's new product is made from continuous weld pipe in the smaller size and from seamless in sizes over 4 by 4 or 5 by 3. By using its big hot rolling mills, National is able to go up to dimensions required for heavy work.

National Tube prices its hollow structurals $10 to $40 a ton under the going rate for tubular shapes. The price is slightly higher than that of conventional structurals.

Like conventional structurals, the new product is being priced on a weight basis.

Other producers have reduced prices of the more popular hollow structurals to the levels established by National Tube.

There has been a move in the industry to extend the size range of shaped tubing. The Ohio Seamless Tube Div. of Copperweld Steel Co. installed two new electricweld mills. The larger of these goes up to 7½ in. tube diameter, which gives a square 6 by 6. Van Huffle last year raised its section sizes to 8 by 4 and 6 by 6. And others have moved in this direction.

Vending Hits the Jackpot

$2.5 Billion Industry Uses Four Million Machines

Over four million vending machines racked up $2.5 billion in retail sales last year.

The industry is exploding in all directions. By 1968, machines will dispense everything from dry cleaning to groceries.
By G. A. Mulligan

■ Vending machines are revolutionizing the way U.S. business sells and consumers buy.

It's a $2.5 billion industry today, with more than four million machines in use. By 1968, vending machines will account for $6 billion in retail sales, according to the National Automatic Merchandising Assn.

The industry is exploding in a hundred different directions. Technical breakthroughs are coming rapidly.

The push-button supermarket is already on the drawing boards.

Three-In-One — Three groups make up the vending machine industry: Operating companies that install and service the machines, product suppliers, and about 120 machine manufacturers.

Rudd-Melikian, Inc., Hatboro, Pa., is among the top 10 machine makers. Its plant, with 350 employees, has turned out more than 50,000 units since 1946. Sales last year topped $7.5 million.

"Right now we're concentrating on food items for direct consumer purchase," says K. Cyrus Melikian, board chairman. He told The IRON AGE: "Looking ahead we see space work technologies paving the way to completely automatic supermarkets, ultrasonic dry cleaning, systematized stamp, ticket and telegram machines, and units that will take charge plates as well as coins and bills."

Mr. Melikian and his partner, Lloyd K. Rudd, developed the first coffee machine in 1946. It helped launch the in-plant feeding boom that catapulted retail vending sales from $600 million in 1946 to 1960's $2.5 billion level.

Wittenborg, Inc., Portland, Ore., markets a machine that can be used to vend over 400 food items. It's an elaborate unit equipped with round shelves, each with several compartments. With refrigeration, the machine sells for around $1600.

Modern Models — A host of other machines are on the market.

An interchangeable drum system is the basis of a Wittenborg outdoor vending operation in Stockholm. This unit is 100-ft long, with 1515 compartments. It dispenses everything from hot dinners to nylons and toileteries.

Automatic Canteen Co., Chicago, is marketing another "really big vendor." This six-ft high machine holds 130 different items. It will accept coins and paper money up to $20.

Brass Rail Restaurants of New York has entered the automatic volume feeding field on a national basis. It has added modern meal production methods to bulk buying. The finished products are packaged in vending machines, serviced by local area franchise holders.

Growth Trend—Three recent developments attest to vending's postwar growth:

1. Existing machine manufacturers are consolidating, and others are being acquired by companies outside the industry.

2. Several national and regional operating companies have appeared through a series of mergers.

ON THE LINE: Brew-A-Cup machines are built at the Hatboro, Pa., plant of Rudd-Melikian, Inc. They dispense cups of hot coffee, each individually brewed from fresh ground beans, in six seconds.

3. Securities are now being issued to the public by both manufacturing and operating companies.

Keen Competition — The industry is highly competitive. And it must operate under rigid scrutiny, including frequent health and sanitation checkups.

And there are continuing problems. Sometimes vended products don't make the grade. This gives the customer a jaundiced view of the entire vending operation.

So the industry is constantly seeking ways to improve its product.

Coffee-er Coffee—The first coffee machine of Rudd-Melikian used powdered or frozen concentrates. Many machines still do. The newest development is a machine that actually batch-brews coffee. One called Brew-A-Cup serves cups of hot coffee, individually brewed, in just six seconds.

Microwave cooking is another innovation. Frozen cooked food is placed in a machine and is cooked electronically in seconds.

Providing change for bills has long been a machine problem. A. B. T. Manufacturing Co. now makes a bill changer that leases for $30 a month.

In-Plant Food—Plants, offices and institutions are turning to vending more and more. Over 6000 manufacturing plants with 250 or more employees now provide some type of regular, on-premise, food-serving facility. Total food sales in factories amounted to more than $800 million last year.

Sound Future — The long-term vending potential for in-plant feeding alone is eye-opening. Over half of the nation's 65 million work force, and more than 10 million students, eat at least one meal away from home.

If vending machines capture just 20 pct of this market, as enthusiasts like Mr. Melikian believe they can, it will mean a $3 million-a-day business.

U.S. May Insure New Tool Loans

Program being discussed now would cover purchases of all items of capital goods.

It would supplement tax incentive program; open credit supply to companies short on funds for modernization.

By R. W. Crosby

■ A broad new plan for insuring loans to industry for purchase of all kinds of tools, machinery and equipment is being charted by the government.

The IRON AGE learned that this government insurance plan would cover purchases of all items of capital durable goods.

This is a broader plan than discussed in private government circles when the idea of industrial loan insurance first came up. Original talk was for insuring machine tool loans only (IA, March 23, p. 11).

The loan insurance plan would fill a void now existing in industry. It could open up much needed credit supply.

Credit Need — Although many companies have adequate funds for equipment investing, it is agreed this is the exception rather than the rule. Since 1957, sales of capital durable goods have been lagging.

The government has been giving increasing attention to this problem. President Kennedy himself says the need for machinery and equipment modernization is acute.

In some ways, the President's tax incentive plan for investment in new plant and equipment is expected to fill this need. But tax incentive is no help to companies that can't get the money to invest.

This is where the loan insurance program would help.

Although no definite program for insuring capital durable goods loans is yet established, the U. S. Commerce Dept. would undoubtedly administrate the program.

How Operated—As far as thinking goes now, an equipment and machinery loan insurance program would be built along the lines of the Federal Housing Authority's program for home building.

Like the FHA program, it would have to operate through normal credit channels. It would necessarily require a premium charge.

Unlike the FHA, however, under Commerce Dept. direction it would not have broad separate powers. Apparently, under such a program, the government would not set interest rates as it does in the case of the FHA.

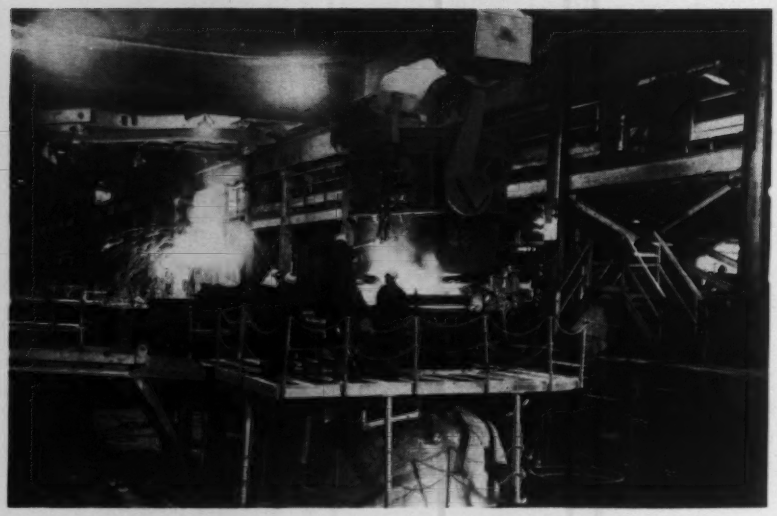
The new loan insurance program would keep all present credit activities intact. Its purpose would be to offer insurance so that more companies could obtain loans.

Cost-Free—It is likely that such a program wouldn't cost the government a cent. The FHA, for instance, operates in the black.

The general feeling within industry now seems to be a desire for more credit. The Machinery and Allied Products Institute, for instance, has spoken of the need for a larger money supply.

Before a Congressional committee a MAPI spokesman said the "primary limitation on fixed investment by American industry is not a dearth of attractive projects; it is the supply of available capital funds."

This belief was expressed by George Terborgh, MAPI research director. He continued: "While there are always some concerns that have more funds than they can currently spend to advantage for plant and equipment, this is not the typical or predominant situation."



TIGHT SCHEDULE: Vacuum casting of the huge Bethlehem Steel ingot took split-second timing. Four electric furnaces were tapped.

Vacuum-Cast Ingot Biggest Ever Made

Bethlehem Steel Co. poured a 535,000-lb vacuum-cast ingot, largest ever produced.

It will be forged into the world's biggest single-piece generator rotor for a new TVA 800,000 kw steam turbine.

■ Bethlehem Steel Co. last week poured the largest vacuum-cast ingot ever attempted, at its Bethlehem, Pa., plant.

Four electric furnaces were tapped to supply 535,000 lb of nickel-molybdenum-vanadium alloy steel. The ingot will be forged into the world's largest single-piece generator rotor. It is for an 800,000 kw steam turbine which General Electric Co. is building for the Tennessee Valley Authority.

Concise Timing — Eight tons heavier than any previously cast, the ingot was poured on a split-second schedule.

The operation took exactly 36 minutes, 15 seconds, from the time the first steel was poured into the pony ladle until the final heat from the fourth furnace had entered the 270-ton capacity degassing chamber.

Huge Mold—To pour the ingot, a special mold 120 in. diam and 175 in. high was designed. It slipped into the vacuum chamber with about ½-in. to spare.

Forging Plan — In the forging process, the ingot will be brought to a uniform temperature of about 2300°F over a period of 80 hours. It will then be worked for an hour in a 7500-ton press forge, then reheated for 20-24 hours and returned to the press forge for 2.5 hours for its final shaping.

After forging, the piece will be heat-treated to a minimum yield strength of 70,000 psi, and a minimum tensile strength of 92,000 lb. Rough-machined weight will be 288,917 lb, about half the weight of the original ingot.

McLouth Expands Cold Rolling

McLouth Steel Corp. has launched a $7 million expansion program at its Gibraltar, Mich., plant.

Designed to boost cold rolling capacity, the expansion involves extension of present buildings and extra auxiliary equipment.

McLouth's Gibraltar plant was built in 1955 at a cost of $20 million.

Color Coded Conduit Reaches Market

A color coded steel conduit was introduced last week by the National Electric Div., H. K. Porter Co., Inc.

Supplied in five standard colors, the new product sells at 5 to 10 pct over the price of standard conduit.

According to National Electric, it saves the user 7¢ a foot in painting costs. The company says 1.5 million lb of the new conduit has been ordered for a single steel mill construction project.

Factory Trend—Purpose of the coloring is to distinguish electric conduit from telephone lines and other types of piping.

In factories, there has been a trend toward color identification for maintenance purposes. Normally, this is done by painting on the site.

National Electric is applying a polyvinyl coating, with color pigment added, in a dipping and baking process. The coating goes over a galvanized surface on both the inner and outer walls of the conduit.

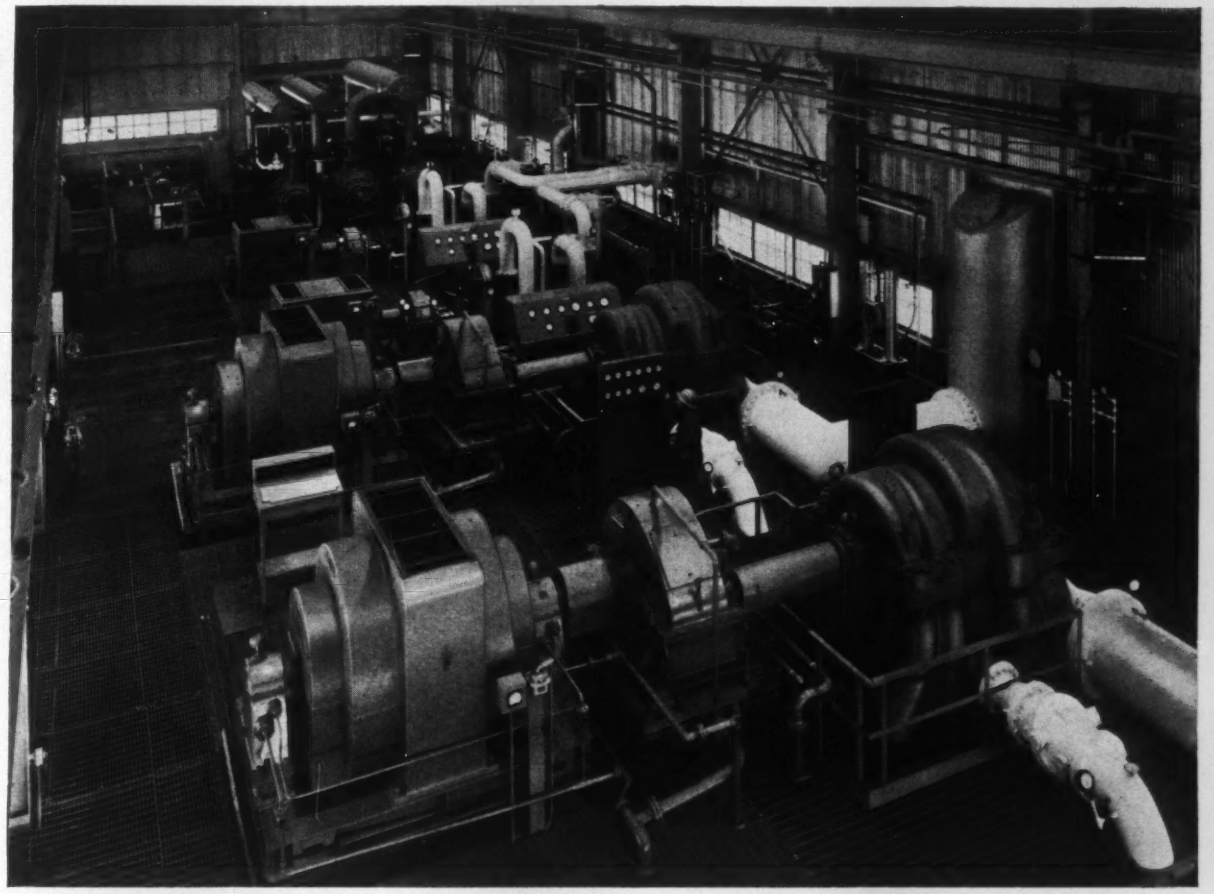
Market Firms — Introduction of this premium product comes as the market for conduit shows signs of firming.

Makers of both aluminum and steel conduit have indicated they will reduce distributor discounts by 5 pct July 1. The 5 pct had been added on a temporary basis last spring.

However, the conduit business has improved only seasonally, says S. C. Powers, general manager of National Electric.

NEW CENTRIFUGAL AIR COMPRESSORS BY CLARK

The plus factor in modern oxygen plants for steelmaking



One good reason why so much U.S. oxygen capacity for steelmaking is handled by Clark compressors, is the ability of Clark engineers to develop complete compressor systems.

A typical steel mill oxygen plant installation is pictured above. In addition to being equipped with four proven Clark centrifugal oxygen compressors and a non-lube reciprocating unit handling nitrogen, this plant uses the new Clark *IsoTemp* centrifugal air compressor. Two of these machines are shown handling "100 lb. air" in the first stage of air separation.

Twenty-five *IsoTemp* compressors have been purchased for installation throughout the world after a careful analysis of features by informed U. S. and European engineers. Among the factors which influenced their choice: Four-stage, isothermal type design; the use of integral base-mounted intercoolers between each compression stage for maximum efficiency; low installation cost as a result of compact design; isolated bearing chambers combined with a unique seal porting system to eliminate lube oil contamination of the compressed air stream.

The user's confidence in the reliability of the new Clark *IsoTemp* is well founded. These machines have met all predicted performance guarantees and have proved trouble-free in every respect.

Clark Bros. Co. has unusually broad experience in the manufacture of all types and sizes of centrifugal and reciprocating compressors. If you are considering expansion, let Clark engineers help you plan for the most profit.

For further information, contact our nearest office or write to:

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DRESSER INDUSTRIES INC.

OIL • GAS • CHEMICAL
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INDUSTRIAL BRIEFS

Sauveur Honor—Dr. C. L. Clark, staff metallurgical engineer, Timken Roller Bearing Co., will receive the 1961 Albert Sauveur Achievement Award of the American Society for Metals. Dr. Clark is a pioneer in high-temperature research.

Forging Slate—W. A. Carlile, Jr., executive vice president, Columbus Bolt & Forging Co., was elected president of Drop Forging Assn. at the annual meeting. W. H. Stocking, executive vice president, Pittsburgh Forgings Co., was elected vice president.

Open House—Liberty Electronics Corp. held an open house at its new facilities at Inglewood, Calif. It marked the third major expansion in five years by Liberty.

Short Division—Miniature Precision Bearings, Inc., Keene, N. H., has formed a new Precision Products Div. It will design and manufacture non-standard bearings, and bearing shaft and component assemblies.

Stamping Grounds — Midwest Stamping & Manufacturing Co. is expanding its plant at Bowling Green, O. It will add a 6000 sq ft steel warehouse.

Bearing Out — Torrington Co. has started a $6 million expansion program. It includes a new bearings manufacturing plant at Clinton, S. C., and a wire mill near the Torrington, Conn., Broad Street plant.

Bigger House—Reynolds Metals Co. has begun a $2.5 million expansion of the alloys plant cast house at Sheffield, Ala. It includes installation of two record-sized holding furnaces with 80,000 lb capacity, which will be paired with two 100,000 lb melting furnaces.

Move East — Liquid Carbonic Div., General Dynamics Corp., is building a new liquid nitrogen-liquid oxygen plant at Tewksbury, Mass. It will produce liquid oxygen, liquid nitrogen and liquid argon to rigid purity specifications.

Extra Division—United Welders, Inc., Bay City, Mich., has formed a new division, United Machines & Engineering, Inc., at Fort Smith, Ark. It will design and fabricate equipment for plastic parts, foam insulation and special machining.

Greatest Growth—Precision Drawn Steel Co., Pennsauken, N. J., has completed the largest expansion in its history. It involved a 62,000 sq ft manufacturing area addition to boost capacity by over 20 pct.

Triple Output—General Graphite Co., Birmingham, Ala., plans a $500,000 expansion program that will triple production at its Ashland, Ala., graphite plant.

All-in-One—Joseph T. Ryerson & Son, Inc., has completed a 13,000 sq ft addition at its Seattle, Wash., steel and aluminum service plant. It will consolidate Seattle operations at 1200 Fourth Ave., S.

Final Touch—Paul Mueller Co. is winding up a $350,000 expansion program at Springfield, Mo. The metal fabricator has added an office building and plant for the Construction Products Div.

Modern Plant — Hovey Spray Equipment Co. has moved into a new plant at 1001 Rising Sun Ave., Philadelphia. Hovey distributes industrial finishing equipment.

"The raise becomes effective as soon as you do."

New Facility—Atkins Saw Div., Borg-Warner Corp., has opened a new 300,000 sq ft plant and office building at Greenville, Miss. It will make wood and metal cutting saws.

Nuclear Space—Superior Tube Co. plans a $500,000 addition to the main Germantown Pike plant at Collegeville, Pa. It will house the Nuclear Products Div., which fabricates components for nuclear reactors.

Weld Advance—Sylvania Electric Products, Inc., has opened a new plant at Warren, Pa., for the Parts Div. It will produce welded components for the electrical-electronics industry.

Tool Debut—Fred D. Wright Co. has opened a new tool and die plant at Nashville, Tenn. It contains 40,000 sq ft of space and $750,000 in metalworking equipment.

New Company — A new wire rope sling and assemblies manufacturing company, Brown & Perkins, Inc., has been formed at Perth Amboy, N. J. It will specialize in manufacturing wire rope slings, fittings and swaged assemblies for aircraft, marine and industrial use.

Chemical Move—Borden Chemical Co. will build two major chemical plants at Geismar, La. The $15 million project includes a methanol plant, with capacity of 25 million gal annually, and a vinyl acetate monomer plant, with capacity of 50 million lb per year.

Diversey Deal—Heather Chemical Products, Ltd., Toronto, has been purchased by the Canadian subsidiary of the Diversey Corp., Chicago. Heather makes industrial metal cleaners and metal finishing compounds.

Canada's Crane—Southern Industries Ltd., Marieville, Quebec, has been acquired by Crane Ltd., Canada, subsidiary of the Crane Co., New York. Crane now has 13 plants in Canada. Southern makes water and sump pumps, pressure systems, circulators and water softeners.

J & L's new Cleveland warehouse speeds service with ultramodern equipment.

J & L Steel Service Centers—efficient and dependable. Ultramodern equipment at the Department Stores of Steel pays you extra dividends. This Trak-Rak, for example, is a super filing cabinet with 1350 drawers for storing cold finished bars and tubing—the most efficient setup of its kind. Equipment like this, unparalleled expansion, new buildings, the latest machinery and ready-to-go stocks of carbon steel, special steels and stainless—all add up to faster, more efficient service for today's J & L customers.

Take advantage of the streamlined, time-saver service J & L offers. Count on the Department Stores of Steel. You'll get exactly what you want—when you want it.

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The NEW Phillips

POZ-I-DRIV

a revolutionary new fastening development.

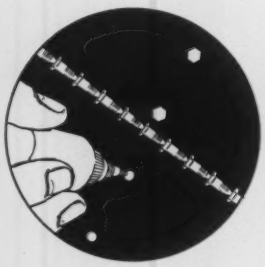
In 1933, American Screw Company gave industry the famous Phillips cross-recessed head, a fastener design that revolutionized assembly operations. And now, American presents the new POZ-I-DRIV fastener recess and driver . . . a development that offers significant reductions in assembly time and costs, increases fastening strength, improves product appearance and performance, and boosts profits.

The new POZ-I-DRIV recess is similar to the Phillips design, but provides greater driving area with reduced recess depth. This combination produces several significant advantages, including:

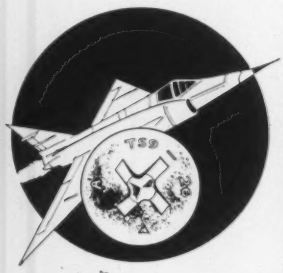
1. **GREATER TORQUING ABILITY** . . . making it possible to drive threaded fasteners tighter at continuous production speeds because of reduced operator fatigue.
2. **BETTER DRIVER-RECESS ENGAGEMENT** . . . practically eliminates cam-out, reduces bit wear, prolongs bit life.
3. **INCREASED DRIVING AREA** . . . with better driver stability permits shallower recess resulting in increased head strength.
4. **IMPROVED AXIAL ALIGNMENT** . . . and positive bit engagement permit 90° offset driving.
5. **COMPLETE COMPATIBILITY** . . . with present Phillips bits for field service.

AMERICAN SCREW COMPANY
Leader in Fastener Development

Since 1838, American has been making important contributions to industrial progress by the continued development of new and better threaded fasteners. Here, for example, are 3 recent developments by American Screw Company:



SCREWSTICK . . . consists of machine and fluted thread-cutting screws in "stick" form. Used with automatic-feeding driving tools, they can be applied as fast as the operator can position the assembly. Available in steel, brass, aluminum, nickel silver and stainless steel alloys.



TORQ-SET . . . designed for the expanding needs of supersonic aircraft, missiles and electronic components, where maximum wrenchability and reliability are of prime importance. Recess design eliminates burring that would interfere with laminar flow.

TRI-WING . . . a tamper-proof fastener, which is virtually impossible to remove without mating tool. Designed for maximum security against tampering or pilferage. With high torquing characteristics for applications requiring extreme strength or vibration resistance.

AMERICAN SCREW COMPANY
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Choosing a New Business Site?

If you are planning to relocate any of your plants or offices, you have a wide choice of sites.

Making the right choice is more than a matter of convenience; it's also a matter of economics.

■ Many companies today are running into the problem of relocating some or all of their operations.

Obsolete plants may dictate a move to facilities that can be operated more efficiently at a lower cost. Or possibly just more space is needed. In the same way, office space may be getting too crowded for efficiency.

Where to Go—If complete relocation is needed, the obvious question is where. Should both plant and office head for more open spaces? Should plant and office be split? These are just some of the questions that arise.

Some of the answers are suggested by Julian J. Studley, New York specialist in real estate leasing.

Office in Town—"Headquarters of a company should be in a metropolitan city, the real centers of commerce," Mr. Studley tells The IRON AGE. "Executives and sales people should not be isolated.

"But manufacturing operations should avoid cities. First of all, space is cheaper in the suburbs. And, perhaps more important, the labor pool of unskilled workers who can be trained to a particular function is usually bigger and employment rates may be lower."

Luxury and Prestige—Mr. Studley is a firm believer in the company's headquarters helping to establish the corporate image. "Headquarters is really part of a company's sales pitch," he says. "It should reflect the corporate image to customers, employees, and stockholders."

Does this mean luxury and floors and floors of high-cost office space for all white collar people? Not necessarily. Mr. Studley points out a trend that is common in New York and could be applied in other large metropolitan areas.

Some companies maintain their corporate offices in high-cost prestige areas, but have clerical staffs in comfortable, but lower-rent quarters in another part of the city. Communication is a minor problem, but easily handled.

This is even done by some large companies which may own the entire building.

How to Succeed in the Capitol

■ If your company or industry association does any lobbying in Washington, it would pay you to take a look at Sen. Hugh Scott's "Primer for Pitiless Pressure Groups."

The Pennsylvania Republican is fully aware that it is often necessary for people in industry to contact their representatives in Congress. But, tongue in cheek, he cites these rules as a warning against too much pressure:

Be sure of your timing. Catch your public official when he is extremely busy and fully occupied. His resistance will be low and you can knock his guard down. Of course, he will hate you and swear vengeance on your cause, but you will have made an impression.

Always stress the number of voters you represent, upping the actual number by 10 to 100 times. . . . Your ability to frighten an official is limited only by your opposition's ability to frighten him in the other direction.

Don't hesitate to embarrass an office holder. Nail him as he is talking to his friends or confront him with a menacing crowd of your cohorts. This will keep him off base, which is why this tactic is referred to as a "base" method.

Whether you are being vague or specific, be emphatic about it. Here's how to be emphatically vague: Speak of "H. 1378" or of "S. 4988." Since there is a new H. 1378 in each Congress, the public official will have to look up the current bill, and this prevents him from discussing the subject intelligently. How to be more emphatically specific: Write him a six-page letter with all the details. Pour on the reasons. Don't believe those who think one good reason is enough.

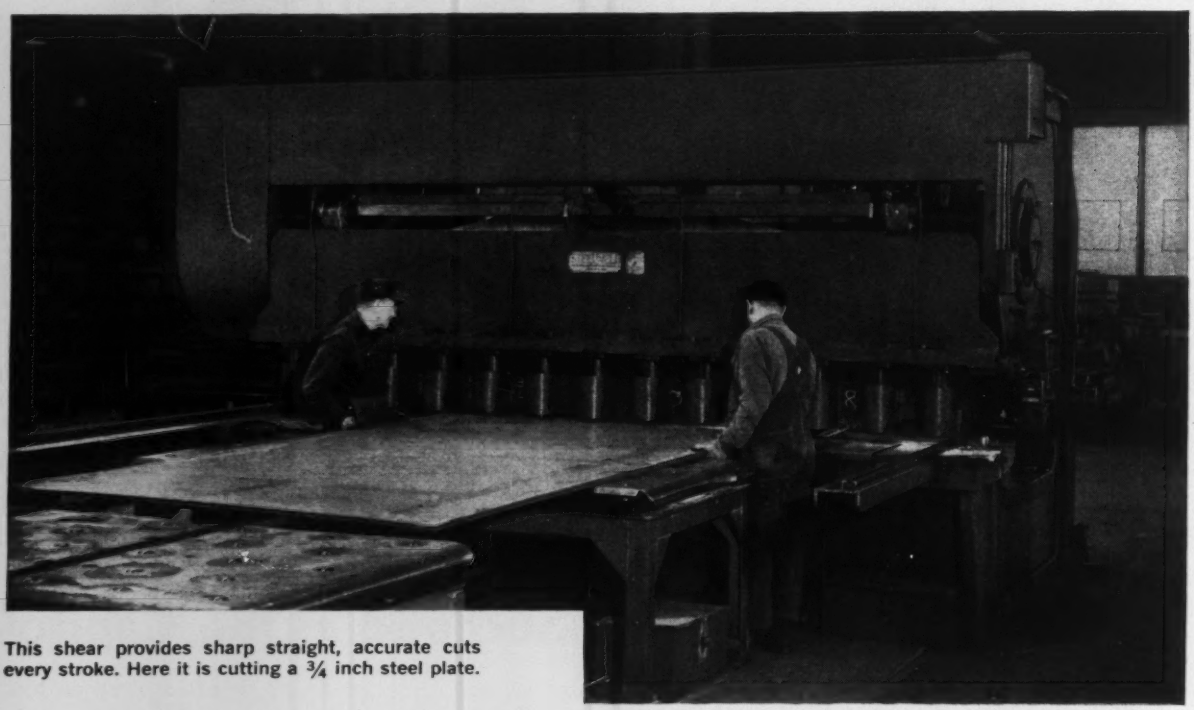
Be zealous. See the public official not once but many times. Write to him. Wire him. Call him at home around dinner time. Sheer numbers count. Besides, a single visit can hardly justify the expense account.

Corner your office holder at a social gathering. Be sure you monopolize his attention.

If all of these tactics hurt your cause, get another cause.

STEELWELD SHEAR WORKS 3400 HOURS A YEAR

"Serves Art Iron, Toledo" for Over 10 Years



This shear provides sharp straight, accurate cuts every stroke. Here it is cutting a ¾ inch steel plate.

All shearing at the Art Iron & Wire Works, Inc., a 200-employee plant in Toledo, Ohio, is done on a Steelweld Pivoted-Blade Shear rated for ¾" x 12'-0" mild steel. This is the only shear in the plant.

Art Iron manufactures ornamental iron and structural steel items to order and also has a large steel warehousing operation. An inventory of over 10,000 tons of steel of every kind, size and shape is maintained to serve any need. This work keeps the Steelweld busy cutting a great variety of steel items varying in thickness from 18 gauge to ¾ inch.

The Steelweld feature most valued by Art Iron is the knife-clearance adjustment. They know that to obtain the best cut with the least burr and distortion, it is essential to have the clearance set to suit the plate thickness. Because this adjustment is so easy and fast to make, their shear operators make it automatically as a part of the regular shearing routine.

Knife life is very satisfactory. This is attributed in large part to the shear operators consistently using the proper knife clearance. Despite the large tonnage of steel cut, the knives usually require regrinding only once in a period of four months or longer.

The Art Iron, Ft. Wayne, Indiana, plant also has a Steelweld Shear. Its purchase several years ago was influenced by the success with the machine in Toledo.

Prefabricated industrial buildings are among the many items made by Art Iron. These require a large number of plates for footings, gussets, splices, etc., all of which are sheared on the Steelweld.

Write for free copy of catalog No. 2011

STEELWELD

PIVOTED BLADE *Mechanical and Hydraulic* **SHEARS**

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

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Step Up New Outlays For Plants, Equipment

Metalworking's Capital Spending Plans
No. 2 of a 1961 Series

Metalworking plants boosted new capital appropriations 32 pct in the first quarter.

Recovery forces now at work may set off higher capital goods buying by the fourth quarter.
By E. C. Beaudet

■ Capital spending plans by metalworking companies have taken a definite turn for the better.

Money set aside for new plants and equipment in the first quarter increased some 32 pct over fourth quarter 1960. And, for the first time in over a year, the metalworking industry raised, rather than lowered, new capital appropriations.

These are the results shown by a first quarter survey of capital appropriations by metalworking companies conducted for The IRON AGE by The National Industrial Conference Board.

Increases Pin-Pointed—The most dramatic gains were posted by primary metals producers. They came up with a fourth-to-first quarter increase of 90 pct.

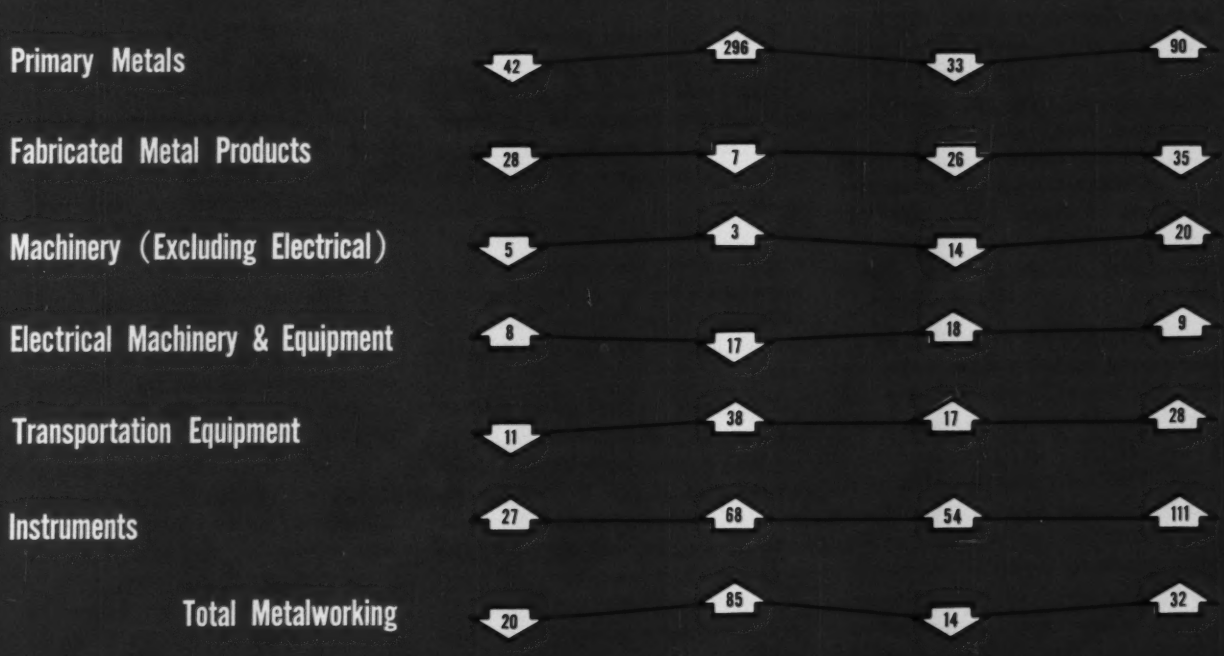
Joining the primary metals industry in the appropriations upswing are: Transportation equipment, up 28 pct; nonelectrical machinery, up 20 pct; electrical machinery, up 9 pct; and instruments, up 111 pct.

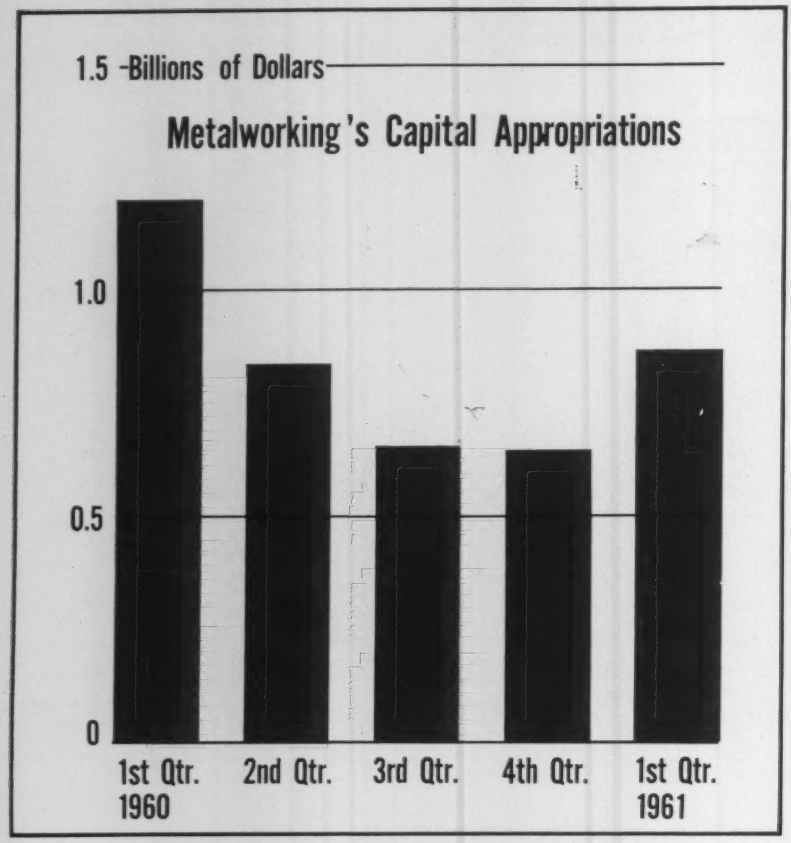
A major exception to the trend is manufacturers of fabricated metal products. This industry cut back new appropriations 35 pct from the fourth to the first quarter of this year.

The Significance—A good part of the fourth-to-first quarter dollar boost in capital appropriations must be laid to seasonal changes. The table below, however, shows that this is only part of the story.

The 32 pct overall gain from the

Healthy Signs of a Change for the Better





fourth quarter to the first quarter this year is a much healthier sign than the 14 pct drop in first quarter 1960, and the 20 pct cut back at the beginning of 1958. But it is still a far cry from the 85 pct gain registered in first-quarter 1959 which led off the big expansion wave that year.

All in all, this first quarter survey of metalworking capital appropriations by some 38 metalworking industries points to a change for the better in the capital goods market.

Forces at Work—The first quarter survey turns up three major recovery forces now working to brighten the capital goods market. They are:

1. The more-than-seasonal gain in new capital appropriations from the fourth quarter of 1960 to the first quarter this year.

2. A reversal of the downward trend in new capital appropriations for the first time in over a year.

3. An increase in the number of companies and industries setting aside higher amounts for future capital goods spending.

Effects in Fourth Quarter—Since appropriations in most cases lead expenditures by six to nine months, the recovery forces now underway are expected to have an impact on capital goods orders by the fourth quarter.

Meanwhile, despite these signs of improvement, first quarter capital appropriations by metalworking companies have yet to reach the dollar levels set in first-quarter 1960.

Compared to first quarter 1960, new capital appropriations by metalworking companies in the first quarter dropped 25 pct. Primary metals were off, 38 pct; fabricated metals, 40 pct; nonelectrical machinery, 31 pct; electrical machinery 17 pct; and transportation equipment 15 pct. Instrument makers held about even.

Positive Signs—Despite the year-to-year drop, the first-quarter cut backs are much less severe than those which took place in fourth quarter 1960. At that time new capital appropriations in metalworking fell 48 pct below fourth quarter 1959.

This lessening of the severity of the year-to-year cutbacks in new capital appropriations is still another sign of a more positive direction for capital goods spending in metalworking.

If new capital appropriations by metalworking companies continue to rise in the second quarter, the industry may be expected to boost capital goods buying substantially. Meanwhile, here is a rundown of the gains and losses by major groups from the fourth to first quarters.

Primary Metals—In the primary metals industries, iron and steel makers, ferrous foundries, and nonferrous metal smelters showed gains in new appropriations from the fourth to first quarter. The other nonferrous industries in the group, however, recorded declines.

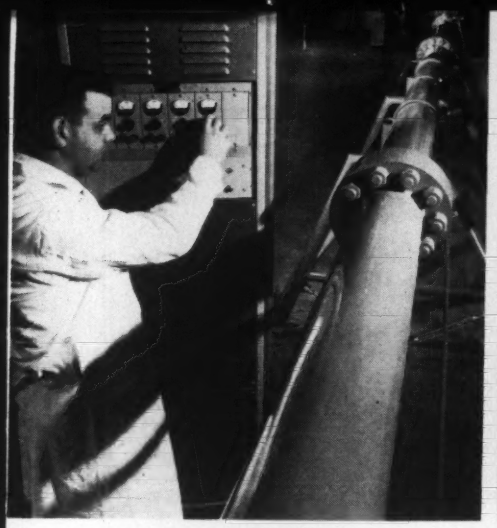
The losses by nonferrous groups were more than offset by the basic iron and steel industry's quarter-to-quarter gain of 134 pct. Appropriations in basic steel rose from $57.8 million to $135 million and made possible an overall gain of 90 pct for the entire group.

Though lower in dollar amounts, steel foundries raised appropriations sights by 950 pct. Nonferrous foundries, however, cut back new appropriations 83 pct in the first quarter.

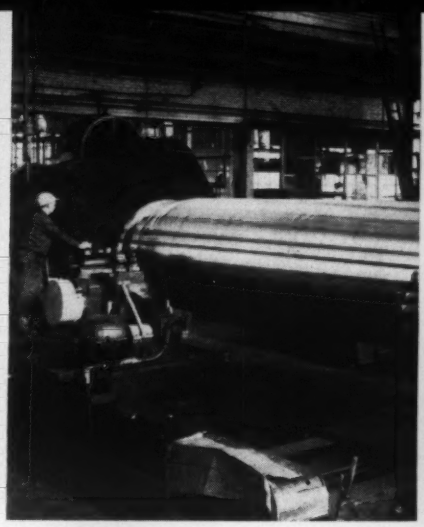
Fabricated Metals—In the fabricated metal products group, five of the eight industries increased new capital appropriations from the last quarter of 1960 to the first quarter of 1961.

Those posting gains were manufacturers of cutlery, plumbing equipment, screw machine products, stampings, and miscellaneous fabricated metal products.

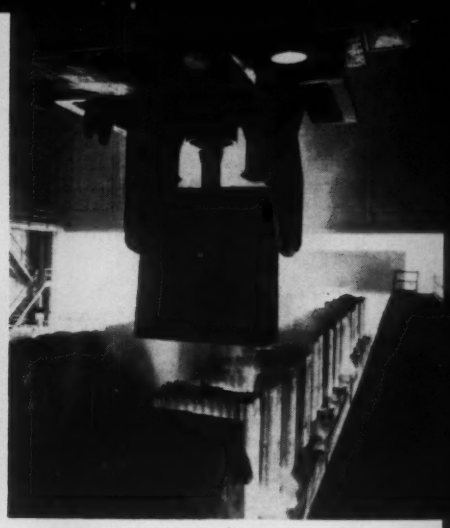
However, the 69 pct decline in appropriations by makers of metal cans pulled down the metal fabri-



INSTRUMENTS: Makers boosted new appropriations 111 pct.



MACHINERY: First quarter gains made up for declines in last half.



STEEL: A 134 pct jump raised primary metals total 90 pct.

cating total. Part of the decline in metal cans can be explained by the record high appropriations in that industry during the last three months of 1960.

Fabricated structural products also declined on a quarter-to-quarter and year-to-year basis. However, part of the 44 pct first quarter decline was seasonal. Stampings registered gains on the year-to-year basis, but declined on the quarter-to-quarter basis.

Nonelectrical Machinery — New appropriations by nonelectrical machinery gained about 20 pct in the first quarter of 1961 over the previous quarter. The recovery in nonelectrical machinery also followed a pattern similar to that in primary metals and transportation equipment. The decline that started in the second quarter of 1960 deepened in the third and fourth quarters.

First quarter 1961 appropriations gains undercut that decline substantially.

Approval gains occurred in farm machinery, largely owing to the recent better-than-seasonal advance in production and sales.

In the first quarter of 1961, office and computing machines showed a contra-seasonal increase in new appropriations over the fourth quarter. Manufacturers of metalworking equipment, special industry machinery, and general industrial machinery also approved a larger volume of capital funds in the first quarter than in the last three months of 1960.

The declining industries in the nonelectrical group were construc-

(continued on p. 54)

First Quarter Gains Reverse Downtrend

Major Metalworking Groups

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Metal Furniture	25	$1.5	$1.7	$2.7	$3.0	$1.6	$1.2	−26 Pct	−30 Pct	+ 4 Pct
Primary Metals	33	379.7	254.8	229.9	107.3	92.1	175.2	+90	−38	−53
Fabricated Metal Products	34	69.0	51.2	32.9	30.8	47.0	30.7	−35	−40	+16
Machinery (ex. Electrical)	35	154.4	133.5	61.5	68.5	76.6	91.7	+20	− 3.1	+ 7
Electrical Mach. & Equip.	36	74.0	87.4	66.7	44.9	66.6	72.8	+ 9	−17	+39
Transportation Equipment	37	156.1	183.3	125.6	168.8	121.7	155.8	+28	−15	+ 9
Instruments, etc.	38	11.2	17.2	13.4	14.2	8.2	17.4	+111	+ 1	+11
Total Reported[1]		846.0	729.1	532.7	437.4	413.9	544.8	+32 Pct	−25 Pct	−26 Pct
Total Estimated for All Metalworking[2]		$1377.9	$1156.4	$840.8	$653.7	$641.2	$867.0	+35 Pct	−25 Pct	−21 Pct

Based upon returns from 483 companies reporting 710 separate industry groups.
[1] Excludes ordnance and accessories, SIC Code 19, and miscellaneous manufacturing, SIC Code 39.
[2] Estimated for entire metalworking universe. This includes metalworking firms operating at least one plant employing 500 or more production workers in 1957. See coverage table, page 54.
Source: The National Industrial Conference Board.

Primary Metal Industries

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Blast Furnaces, Steel Wks. & Rolling Mills	331	$332.0	$185.1	$140.3	$43.3	$57.6	$135.2	+134 Pct	−27 Pct	−60 Pct
Iron & Steel Foundries	332	8.7	13.2	12.0	18.3	1.3	13.4	+950	+ 1	+33
Primary Smelt. Nonferrous Metals[1]	333–334	17.5	17.4	21.4	19.3	11.0	13.1	+19	−24	−46
Rolling, Drawing, Extruding Nonferrous	335	16.0	25.1	51.8	24.6	19.1	11.5	−40	−54	−26
Nonferrous Foundries	336	2.1	4.7	2.4	1.1	1.3	0.2	−83	−95	+466
Misc. Primary Metals	339	3.4	9.3	2.0	2.7	1.8	1.7	− 3	−82	+179
Total	...	$379.7	$254.8	$229.9	$107.3	$92.1	$175.2	+90 Pct	−31 Pct	−46 Pct

[1] Includes secondary nonferrous smelters, SIC 334.

Fabricated Metal Products

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Metal Cans	341	$16.2	$22.3	$9.3	$6.5	$22.1	$6.7	−69 Pct	−70 Pct	+85 Pct
Cutlery, Tools, Hardware	342	29.5	3.1	3.1	8.8	5.0	4.9	− 2	+56	0
Heating Apparatus (ex. Elec.) & Plumbing Fixtures	343	3.8	3.0	4.3	3.2	4.0	4.1	+ 2	+34	+74
Fabricated Struct. Products	344	10.1	13.0	4.2	3.4	7.6	4.2	−44	−67	+97
Screw Products & Rivets	345	3.7	2.1	1.3	1.1	1.2	1.1	−12	−47	+10
Stampings	346	3.0	2.6	6.5	3.6	4.7	4.5	− 5	+70	−79
Coating, Engraving; Misc. Fabr. Wire Prod.	347–348	0.3	1.9	0.6	0.4	0.3	0.8	−76	−59	+162
Miscellaneous Fabricated Metal Products	349	2.4	3.2	3.6	3.7	2.1	4.4	+106	+35	− 7
Total	...	$69.0	$51.2	$32.9	$30.8	$47.0	$30.7	−35 Pct	−40 Pct	+16 Pct

Transportation Equipment

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Motor Vehicles & Equip.[1]	371, 375, 379	$98.1	$121.3	$99.4	$133.0	$62.6	$88.1	+37 Pct	−29 Pct	+23 Pct
Aircraft & Parts	372	55.2	55.1	21.7	29.7	53.9	63.1	+17	+15	+ 2
Ship & Boat Building	373	1.6	4.3	2.6	5.3	3.3	5.4	+65	+26	+32
Railroad Equipment	374	1.2	2.6	1.9	0.8	1.9	1.2	−37	−54	+25
Total	...	$156.1	$183.3	$125.6	$168.8	$121.7	$157.8	+28 Pct	−15 Pct	+10 Pct

[1] Includes motorcycles, bicycles and parts, and miscellaneous transportation equipment.

Electrical Machinery

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Elec. Transmission Equip.	361	$15.1	$10.1	$13.8	$4.6	$15.3	$4.1	−73 Pct	−60 Pct	+22 Pct
Elec. Indus. Apparatus	362	11.4	15.7	8.2	12.1	5.8	7.4	+28	−53	+91
Household Appliances	363	4.5	8.1	5.1	4.8	9.1	6.5	−29	−20	−17
Electric Lighting & Wiring Equipment	364	6.7	6.6	11.4	3.2	6.5	8.2	+26	+24	+136
Radio & TV Receivers	365	2.4	3.0	1.9	3.4	3.5	0.6	−83	−80	+129
Communication Equipment	366	14.8	13.1	3.3	7.9	12.5	19.7	+57	+50	+30
Electronic Components	367	18.3	30.1	22.5	8.6	13.7	25.8	+88	−15	+55
Misc. Electrical Equipment	369	1.0	0.8	0.6	1.5	0.4	0.5	+121	−18	−47
Total	...	$74.1	$87.4	$66.7	$44.9	$66.6	$72.8	+ 9 Pct	−17 Pct	+39 Pct

Nonelectrical Machinery

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Engines & Turbines	351	$23.6	$9.9	$5.0	$4.6	$8.0	$7.0	−13 Pct	−29 Pct	−57 Pct
Farm Machinery & Tractors	352	12.9	9.2	7.7	7.2	9.6	14.3	+49	+55	−45
Construction, Mining, Handling Equipment	353	12.4	44.1	5.9	3.6	10.8	4.2	−61	−91	+31
Metalworking Machinery & Equipment[1]	354, 359	6.3	13.2	5.0	5.4	5.7	11.5	+101	−13	+55
Special Indus. Machinery	355	12.3	9.4	10.8	7.0	9.0	9.1	+ 2	− 3	− 1
General Ind. Machinery & Equipment	356	38.2	28.5	8.0	8.0	10.3	19.3	+87	−32	+12
Office & Store Machines	357	45.7	17.6	15.6	27.4	18.4	25.6	+39	+46	+26
Service Industry Machines	358	3.0	1.6	3.5	5.4	5.0	0.7	−86	−54	+31
Total	...	$154.4	$133.5	$61.5	$68.5	$76.6	$91.7	+20 Pct	−31 Pct	− 6 Pct

[1] Includes miscellaneous, nonelectrical machinery, SIC Code 359.

Instruments

Industry	SIC Code	Capital Appropriations—$ Millions 1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	1960 4th Qtr.	1961 1st Qtr.	Pct Change 1st Qtr. 1961 over 4th Qtr. 1960	Pct Change 1st Qtr. 1961 over 1st Qtr. 1960	Pct Change 1st Qtr. 1960 over 1st Qtr. 1959
Laboratory, Scientific & Engineering Instruments	381	$4.7	$6.3	$4.8	$4.9	$2.7	$7.9	+195 Pct	+25 Pct	− 3 Pct
Measuring & Controlling Instruments	382	3.9	5.2	6.1	3.5	3.0	5.2	+74	0	−16
Other[1]	383, 4, 5, 6, 7	2.6	5.7	2.5	5.8	2.5	4.3	+66	−24	+46
Total	...	$11.2	$17.2	$13.4	$14.2	$8.2	$17.4	+111 Pct	+ 1 Pct	+20 Pct

[1] Includes optical instruments, surgical instruments, ophthalmic goods, photographic equipment and watches, clock-operated devices, SIC Codes 383, 384, 385, 386, 387.

(continued from p. 51)

Survey Coverage of Plant Workers

All companies in the industries listed below, with plants of 500 or more plant workers were queried. They account for about two-thirds of the total employment and buying power in the metal working industry. The fourth column shows the percentage of production workers employed by the companies cooperating in this survey. The last column shows appropriations per production worker.

Industry and SIC Code	Production Workers, Thousands	Production Workers, Thousands	Pct of Total Employment	Appropriations per Production Worker,[1] $
	Companies With Plants of 500 or more	Cooperating Companies	Cooperating Companies	
Metal Furniture, 251, 252, 253, 254, 259	31	12	38 Pct	$721
Blast Furnaces, Steel Works, Rolling Mills, 331	595	313	53	1,201
Iron and Steel Foundries, 332	81	61	75	703
Primary & Secondary Smelting, Nonferrous, 333, 334	54	50	92	1,303
Rolling, Drawing, Extruding, Nonferrous Metals, 335	114	80	71	1,331
Nonferrous Foundries, 336	19	13	67	400
Misc. Primary Metals, 339	37	22	59	374
Metal Cans, 341	47	45	95	1,001
Cutlery, Hand Tools, Hardware, 342	54	35	65	614
Heating Apparatus (except elec.) & Plumb. Fixtures, 343	34	21	61	744
Fabricated Struct. Prods., 344	60	30	50	1,646
Screw Prods. & Rivets, 345	26	15	60	309
Stampings, 346	75	54	67	445
Coating, Engraving; Miscellaneous Fabricated Wire Products, 347, 348	21	10	47	215
Mis. Fab. Metal Prods., 349	54	36	67	384
Engines & Turbines, 351	71	58	82	420
Farm Mach. & Tractors, 352	60	34	56	1,196
Construction, Mining Handling Equipment, 353	111	78	71	308
Metalworking Machinery & Equipment, 354, 359	105	64	61	431
Special Industry Mach., 355	47	22	48	1,576
General Industrial Machinery & Equipment, 356	92	62	67	739
Office & Store Machines, 357	78	58	74	1,671
Service Ind. Machines, 358	38	22	59	652
Elec. Trans. Equip., 361	90	49	54	775
Elec. Ind. Apparatus, 362	134	65	48	517
Household Appliances, 363	96	46	48	513
Electric Lighting & Wiring Equipment, 364	55	30	54	984
Radio & TV Receivers, 365	71	27	38	349
Communication Equip., 366	113	52	46	843
Electronic Components, 367	95	62	65	1,139
Misc. Elec. Equipment, 369	27	8	29	228
Motor Vehicles & Equip., 371, 375, 379	638	546	86	683
Aircraft & Parts, 372	522	481	92	350
Ship & Boat Building, 373	61	31	50	535
Railroad Equipment, 374	43	26	61	223
Laboratory, Scientific & Eng. Instruments, 381	41	16	39	1,270
Measuring & Controlling Instruments, 382	41	26	64	680
Other, 383, 384, 385, 386, 387	77	20	26	752
Total	4,008	2,680	67 Pct	$720

* Based upon returns from 483 Companies reporting 710 individual industry codes. Employment figures based on Iron Age Census data, 1957. Figures in last column calculated from unrounded data. Over 1,200 plants with 500 or more production workers reported.

[1] In dollars per production worker, based on appropriations made from first quarter 1959 through third quarter 1959 and plant employment of reporting companies in 1957.

SOURCE: The National Industrial Conference Board.

tion, and mining equipment, and service industry machines.

Electrical Machinery—The electrical machinery group as a whole increased its capital set-asides by only 9 pct from the fourth to first quarter of this year. However, electric lighting and wiring equipment, communication equipment, electronics components, and miscellaneous electrical equipment scored big gains.

The advance in the communication equipment category can be largely explained by the gradually rising output of telephone sets and dial central office equipment.

Electrical transmission equipment showed a somewhat greater-than-usual decline from the fourth to the first quarters. Household appliances declined largely because of the record high appropriations in that industry in the fourth quarter of 1960. Radio and television also dipped in the first quarter.

Transportation Equipment — Transportation equipment appropriations gained about 28 pct in the first quarter of 1961 over the previous quarter. Out of the four components, motor vehicles and related equipment, and aircraft and parts, gained on a year-to-year as well as on a quarter-to-quarter basis.

Motor vehicle industry authorizations gained in the first quarter of 1961 over the previous quarter, but most of the improvement was seasonal.

Instruments — From the fourth quarter of last year to the first quarter of 1961, instruments makers increased new capital appropriations a whopping 111 pct.

Biggest gains were made by manufacturers of laboratory, scientific and engineering instruments, who raised new appropriations levels some 195 pct.

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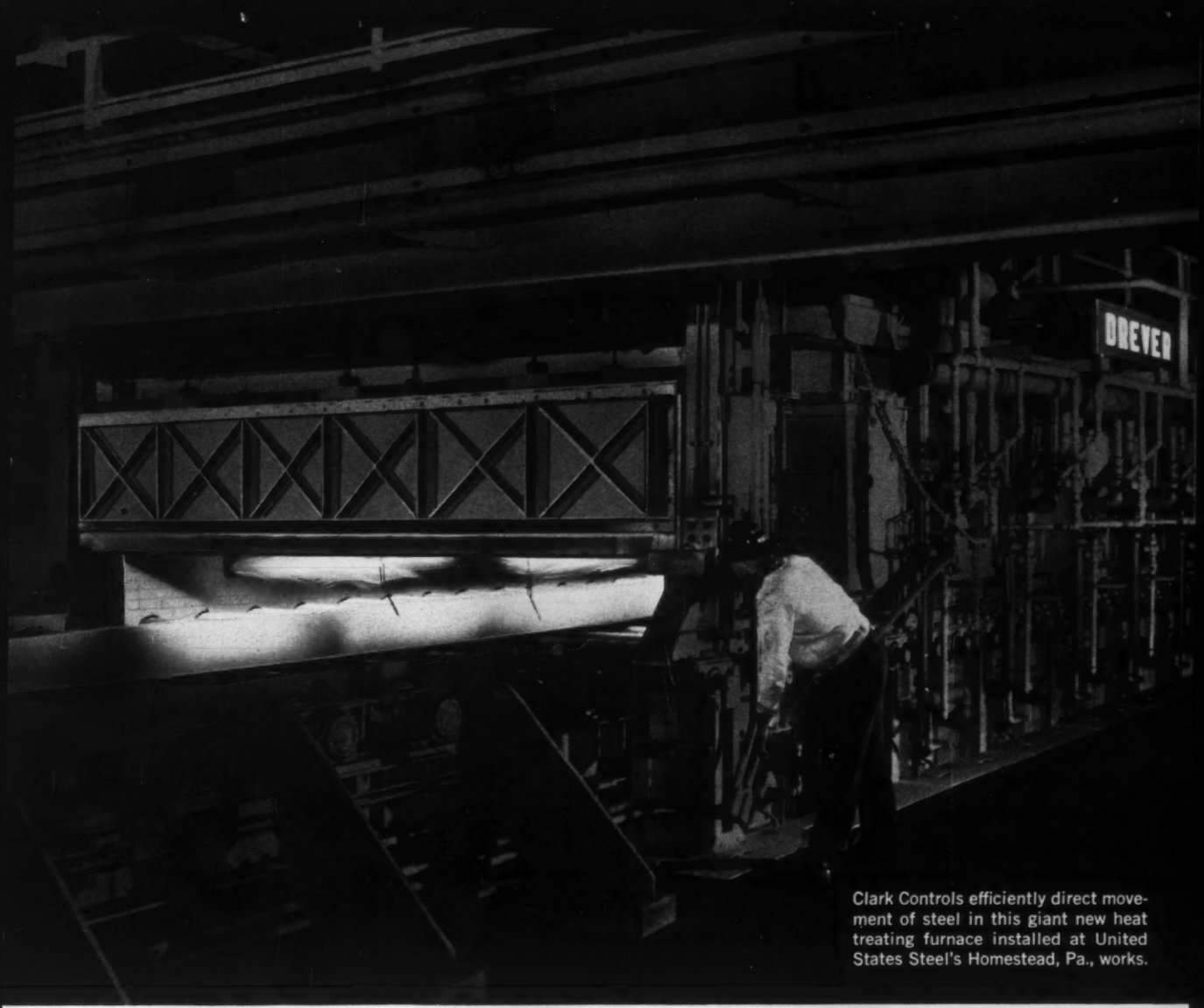

Clark Controls efficiently direct movement of steel in this giant new heat treating furnace installed at United States Steel's Homestead, Pa., works.

Better traffic control for the Automation Highway

Some people believe that automation restricts flexibility. Not so with those whose production is governed by Clark electrical control equipment.

Take the steel industry's new Drever high-output plate heat treating furnaces. The Clark-engineered drive system for plate propulsion gives operators positive control of travel. Twenty-ton slabs move forward, backward, accelerate and decelerate on command. Speed-matching of rollers permits processing several plates at a time. Adjustable speed control makes exit possible with minimum heat loss.

Clark is proud to have been selected by Drever to take complete responsibility for the electrical drives and controls on these highly flexible, automated furnaces. We would like to work with you, too, in integrating power and control for your production highways. Just call the nearest Clark sales office, or write: 61A2

THE CLARK CONTROLLER COMPANY

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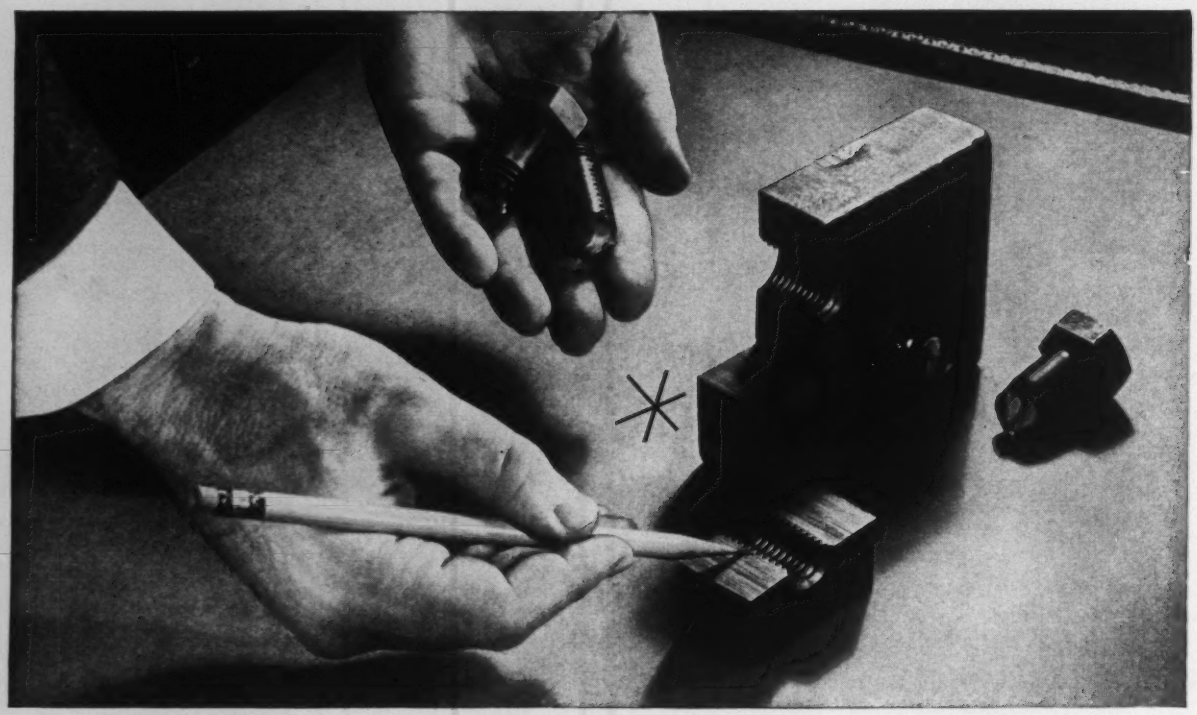

Showed way to save $7800

RB&W fastener survey of refrigeration unit suggested that hex screws be substituted for studs ...and castings be tapped with less costly clearance fit.

When there are no special design requirements or space clearance conditions, using studs of 1-inch diameter and smaller often penalizes the user needlessly. First, in direct costs, since the more economical *hex screws* will do the job. Second, in production costs, since studs require holes tapped with an expensive *interference* thread fit.

The RB&W Man pointed this out when his survey revealed over 250 stud fastenings per refrigeration unit. For this application, 250 hex screws cost $8.45 . . . for a saving of better than $22 over the studs and nuts. Annually this would total to $7800 . . . *clear profit.* And on top of this, reduced tapping costs, too.

Want to get the most from *your* fastener dollars? Ask for an RB&W man to make a survey. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B&W
116th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.

✳ *Specifying studs for fear that hex screws might damage castings during disassemblies is based on a groundless fear. Hex screws in threaded holes with clearance fit can be reused repeatedly without damaging the casting. In the test casting shown above, the hex screws were first tightened and removed 50 times—then torqued to breaking point. Cutaway section showed casting threads were still perfect, with no sign of stripping.*

Aluminum Engines at Crossroads

New Engines for '62 Are Light-Weight Cast Iron

Performance of aluminum engines has come up to expectations. But cost is still a problem.

New developments in casting result in gains this year for cast iron engines.

By A. E. Fleming

■ The auto industry is entering a period which may make or break aluminum engines.

The period, now in the forming stage, could run two or three years. There will be no new aluminum engines added for the 1962 model year, probably none in 1963's. During this time, automakers will refine the manufacturing techniques and re-examine the cost of present aluminum engines.

Ford's Move — Recent developments indicate this. One is Ford Motor Co.'s word of a new precision molding method which permits manufacture of light-weight cast iron engines. Other companies say they will explore this process thoroughly.

Then, there are two significant actions involving General Motors Corp. Buick will use a cast iron V-6 in place of an aluminum V-8 as the standard engine in its Special series next fall. And brand new Chevrolet six and four cylinder motors will be cast iron, not aluminum.

Shifts at Buick—Buick's adoption of the V-6 hints of dissatisfaction with the economics of the semi-permanent mold process used for casting the V-8 block. Engine performance is good and not the problem.

Furthermore, Buick once was partially tooled for an aluminum engine for big cars. A look at production costs of the smaller engine led to the shelving of this idea. Now it seems GM tacticians have decided to wait for a diecasting breakthrough before moving ahead in the light metal program.

Next for Aluminum?—Such evidence tends to indicate a plateau has been reached by aluminum engines after a two-year burst which introduced them into a flock of GM, Chrysler and American Motors cars.

Auto engineers are fast to point out that the aluminum engine is all they hoped it would be on a performance basis. They claim the real concern is economics. They can't seem to make aluminum engines for the same price as cast iron. Weight savings do not, apparently, make up for higher costs.

New Three-Speed Axle

Eaton Manufacturing Co. has announced a new three-speed tandem axle the company claims will get trucks where they're going easier, faster and cheaper.

Officials at Eaton, the country's biggest producer of medium and heavy duty truck axles, expect the three-speed tandem eventually to obsolete a present two-speed version. Over 2 million two-speed types are now in use.

About 85 pct of the parts in the three-speed are interchangeable with the two-speed. Eaton's biggest customers have been Ford, GMC, and International Harvester.

Replacement Muffler Made of Stainless

LESS NOISE: A stainless steel muffler is now marketed by Arvin Industries, Columbus. The replacement unit is being made to fit more than 90 pct of U. S. cars from 1955 on. Cost? About twice conventional unit.

Why let long-established habit dictate your selection of grinding wheels?

Sure, the grinding wheels you've always used may be doing the job, *BUT . . . is that job good enough* in today's cost squeeze? Let Simonds help *you* update *your* grinding practices. Complete line, available through Simonds distributors, includes wheels of all abrasives and bonds, all sizes and shapes . . . all industrially-renowned products, in efficiency-proved specifications . . . and backed by our 60 year reputation as a top-rank producer of abrasive grain and grinding wheels. Send for complete descriptive catalog.

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The Moon: How Valuable to Man?

Engineers and Scientists Discuss Space-Age Problems

First joint national meeting of aerospace and rocket specialists brought 2100 scientists and engineers together.

Topics discussed ranged from man to the moon and how to get the two together.
By R. R. Kay

■ It will cost $10 billion to put a man on the moon. When he lands, he may find clues to the origin of life.

Only heroic measures will assure success on a one-shot space mission.

Man is a nonsymmetrical, fluid-filled sack of variable shape containing a large air bubble.

The solid fuel ramjet is superior to both the liquid-fuel ramjet and the solid-propellant rocket.

ACTION AND REACTION: Problems an astronaut will encounter while trying to work in space are being studied by North American Aviation at Downey, Calif. Here a multiple exposure shows "man in space," seated on stool floating on a cushion of air, has pushed on a handtool (left) and is sent spinning away from his task by the force.

Joint Meeting—These statements merely indicate the wide range of interests of the aerospace industry. Los Angeles hosted the first joint national meeting of the Institute of Aerospace Sciences and the American Rocket Society. Some 2100 scientists, engineers, and executives jam-packed the sessions.

Scores of other subjects reported on:

Air cargo transportation has a bright future. It's growing rapidly. Reductions in both costs and rates will boost the volume of cargo.

Subcontractors and suppliers got more than two-thirds of the $429 million spent on the Polaris missile system last year.

Aircraft for hypersonic speeds will be slender and blunt-nosed.

Moon Glow—"It's not too fanciful to believe that in 20 years, we will consider the moon more valuable than the Ruhr Valley, Korea, Laos, or Berlin." That's the opinion of Trevor Gardner, chairman, United States Air Force Space Study Committee and chairman, Hycon Mfg. Co., Monrovia, Calif.

Boeing Builds Up Jet Backlog

"Disappointing" is the way Pacific Northwest economists report spring business. Most economic indicators were down slightly from a year ago.

Unemployment rose to 6.9 pct. That's quite a jump from spring 1960 when the rate was 5.6 pct. Jobs in primary metals, fabricated metals, and other machinery dropped 1300.

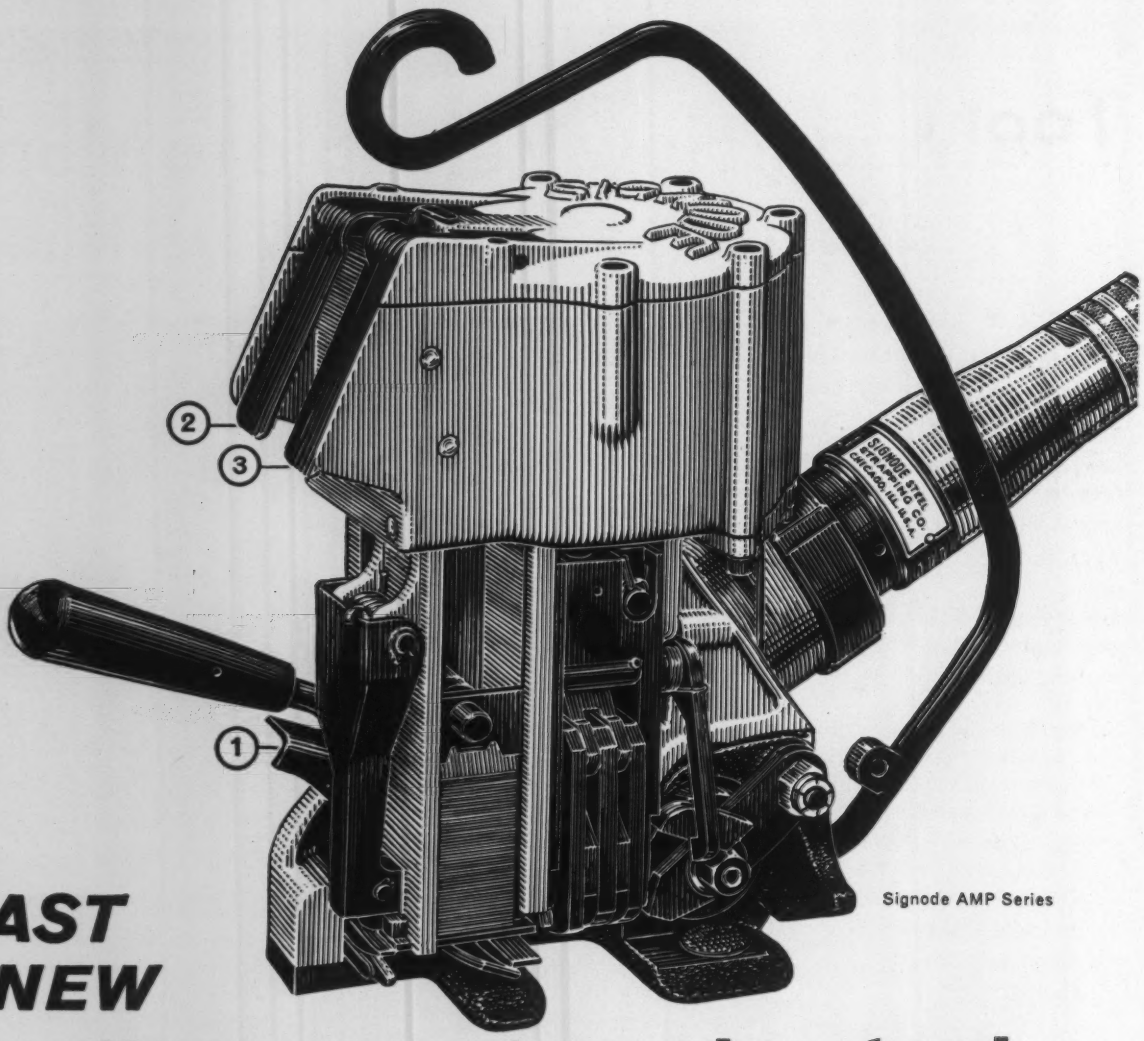
But in the midst of the bad news, there's word from Boeing that its sales outlook is good.

Boeing has an American Airlines order for 25 model 727 jetliners. Cost: $100 million. This brings the company's jet backlog to $1 billion.

Eastward Expansion

The Kennedy Administration promised to put defense work into distressed areas. North American Aviation, Los Angeles, is going along with the plan.

The company will build a 40,000-sq-ft plant in Mercer County, West Virginia. About 300 persons there will get jobs. The feeder plant will do component assembly



Signode AMP Series

FAST NEW all-power strapping tool

- Air power tensions, seals, and severs the strap.
- All the operator does is depress lever #1, insert the strapping, press the tensioning lever (#2), then the sealing-severing lever (#3) and remove the tool.
- Tensioning can be stopped (and held) at any time, as for the insertion of edge protectors.
- Uses new easy-loading Signode NESTACK seals that come in nested stacks (no retaining wire) that eliminate waste, spillage and delay.
- Weighs only 22 pounds, even though the base is steel for maximum durability.
- Compact balanced design and short base make tool easy to use on small as well as large surfaces.
- Comes equipped with universal suspension bracket that's quickly changed for strapping on top or side of package.
- Available now in models for ⅝" and ¾" strapping, .015" to .035" ga. Special high-tension models also available for brick, ingots, tin plate, etc.
- Tension is adjustable to 1200 lb. at 90 p.s.i., regular models.

To evaluate the savings you can obtain with this remarkable new tool in your own operations, call the Signode man near you or send for additional information.

First in steel strapping

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Tool Order Upturn Fails to Show

Builders Expected May to Bring Spurt in Orders

Net new orders for machine tools rose in May over April. This was expected.

But the increase was small. And the figures raise more questions than they answer.
By R. H. Eshelman

■ Orders for machine tools in May were being watched closely as a pivotal month. It had been anticipated that this month might signal the turn, and bring the hoped for rise. However, figures released by the National Machine Tool Builders Assn. fail to reflect any such movement.

Net new orders for metalcutting machines for the month totalled $42.5 million. This was only a 1.4 pct increase from the monthly average of 1960. However, this means only about a $500 million year for the industry—about the same as 1960. Since this is only about 50 pct of capacity, it hardly is optimistic news.

A Spotty Spurt—Some standard machine builders of metalcutting types say they noticed spurts of activity in a few weeks. But these were spotty and there has been no follow through.

Domestic orders for metalcutting types in May came to $31.4 million, or $200,000 above April. But it was about $9 million below March, the best month so far. Foreign sales picked up to $11 million. However, this figure, too, is below March's $14 million.

"The general tone is much better now, and seems to be carrying over into June," reports one machine executive. "We have a feeling that orders could pick up much faster now and carry on through the remainder of the year to a higher level—if some of the uncertainties are removed."

Mothballed Machinery — This opinion appears to be based on the indication that many of the present orders are for replacement. Since there is a substantial unused production capacity in metalworking industry today, any pickup in consumer buying would quickly be reflected in modernization of this mothballed equipment, this executive believes.

Marking Time — In the press field too, sales seem to be marking time. Net new orders for the metal forming equipment totaled on $7.8 million for May. This is 37.6 pct below the monthly average established for 1960.

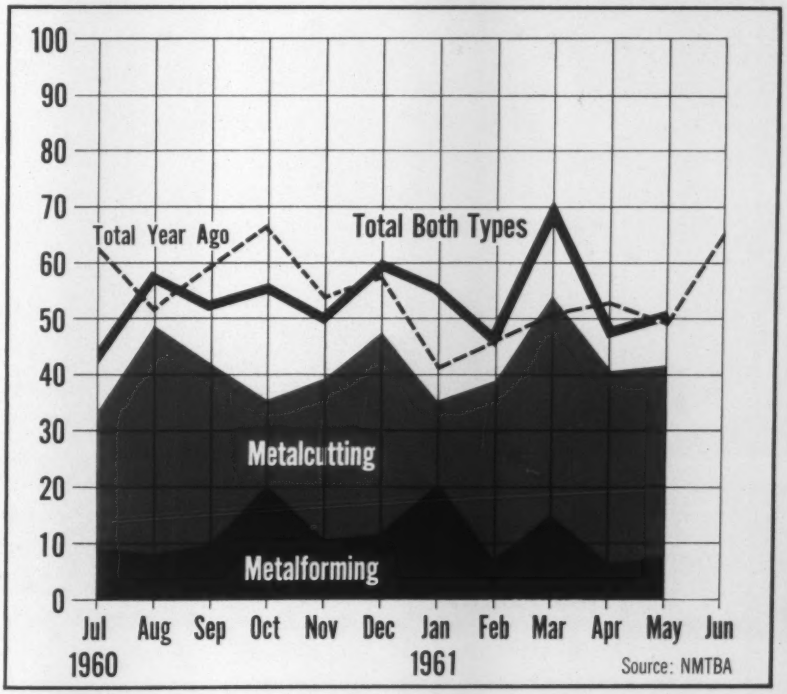
Foreign orders were down again from April, and $3.5 million below March. However, domestic orders topped the unusually poor month of April, while dropping below both March and January.

Unanswered Questions — Big question now for the press makers is whether the foreign orders—mainly from the automakers in western Europe — are over; or whether this is a seasonable drop.

Altogether, the figures for May raise more questions than they answer. The sidewise movement postpones until June the answers that many sought.

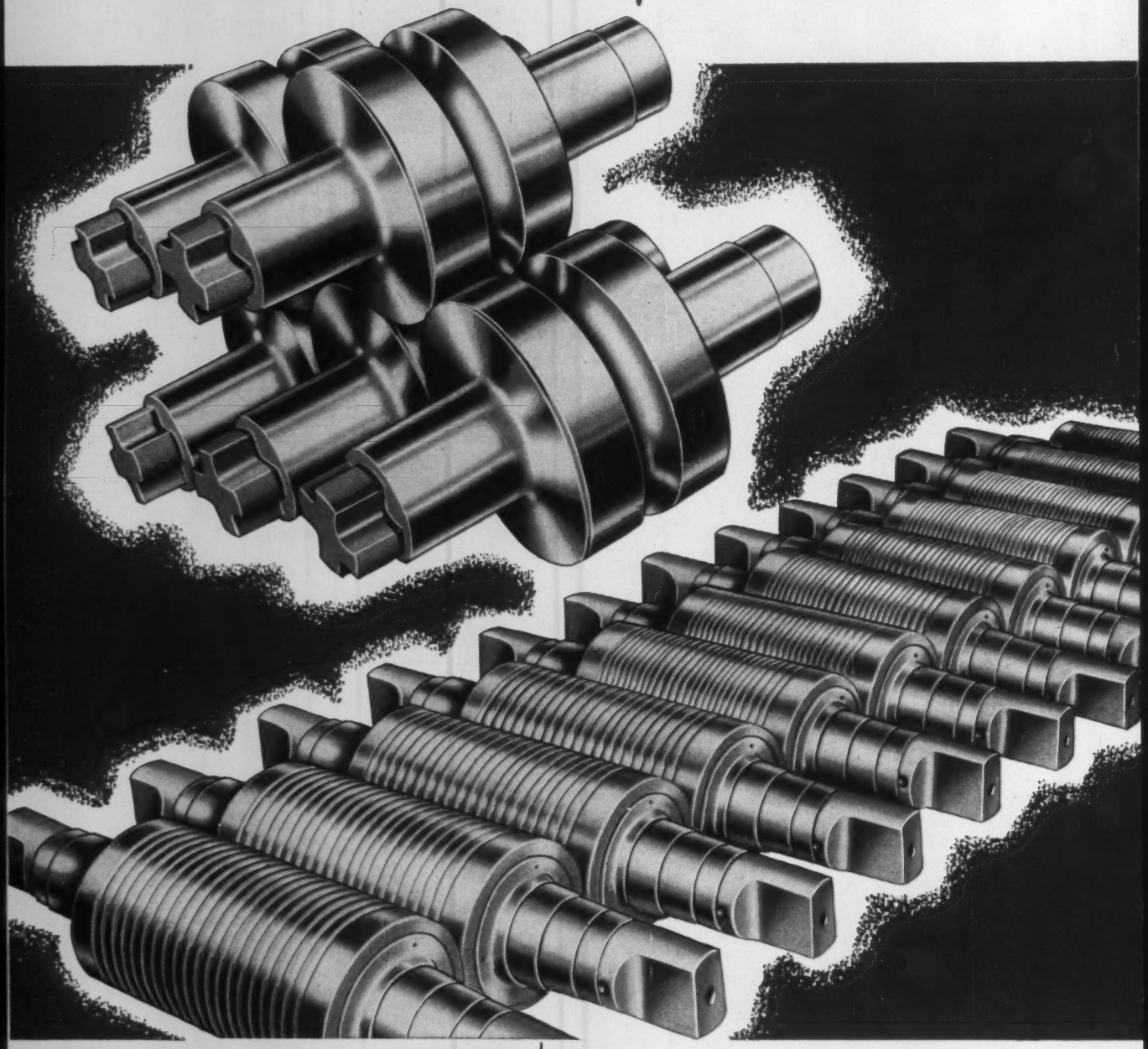
MACHINE TOOLS–NET NEW ORDERS

In Millions of Dollars — Metal Cutting and Forming Types



Ohio Rolls

Shaping Metal for all Industry



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LIMA, OHIO

OHIO IRON and STEEL ROLLS

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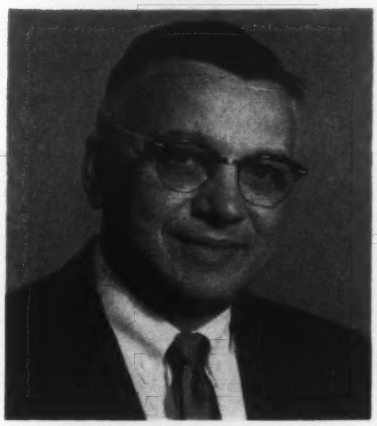
Ohioloy Rolls
Ohioloy "K" Rolls
Nioloy Rolls
Flintuff Rolls
Double-Pour Rolls
Chilled Iron Rolls
Forged Steel Rolls
Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls

PLANTS AT LIMA AND SPRINGFIELD, OHIO. . *Virtually at the center of the Steel Industry*

OR-50

MEN IN METALWORKING



Fred H. Edgar, appointed vice president, aluminum sales, Metals Div., Olin Mathieson Chemical Corp.

Olin Mathieson Chemical Corp.—Derek Richardson, appointed vice president, marketing, Chemicals Div.

American Welding & Manufacturing Co. — Parnell J. Porter, named manager, sales, Industrial Products Div.

Bethlehem Steel Co. — H. A. Sterner, named manager, and T. D. Boak, named assistant manager, sales, Alloy Bar Div.

Joseph T. Ryerson & Son, Inc.—D. E. Woodruff, named assistant general manager, sales.

Taylor Fibre Co.—W. J. Koness, appointed sales manager, Detroit.

Youngstown Sheet & Tube Co.—Dr. W. H. Ceckler, appointed supervisor, applied mathematics and operations research, Research & Development Dept.

Wheeling Steel Corp. — N. W. Blakely, appointed assistant general manager, Yorkville Works.

Armco Steel Corp.—C. M. Struffolino, appointed field engineer, tubular sales dept., National Supply Div.

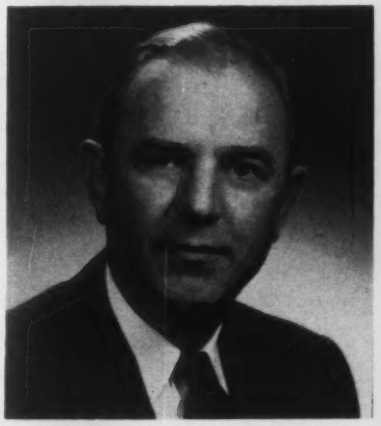
Crucible Steel Co. of America—Anthony Sarkis, appointed traffic manager.

Colorado Fuel & Iron Corp.—C. K. Pearson, appointed general foreman, Pueblo Coke Plant; W. E. Burns, appointed assistant superintendent, Pueblo.

American Chain & Cable Co.—T. R. Merritt, appointed district sales manager, Wright Hoist Div.

Cleveland Instrument Co.—L. M. Nelson, named manager, sales engineering.

Allis - Chalmers Manufacturing Co.—D. W. Erskine, appointed manager, engine engineering, Harvey, Ill., Works.



Bertram S. Parker, elected president, Youngstown Foundry & Machine Co.

Revere Copper & Brass, Inc.—N. F. Kelley, appointed assistant sales manager, New Bedford, Mass.

Birdsboro Corp.—W. E. Metzger, Jr., named assistant sales manager, Hydraulic Machinery Div.

Westinghouse Electric Corp.—F. J. Purdy, appointed manager, sales, Westing-Arc Dept.; P. W. Mahin, appointed administrative assistant.

Torrington Manufacturing Co.—S. W. Klonoski, appointed special assistant to the engineering manager, Air Impeller Div.

Daniel A. Porco, elected vice president, Crucible Steel Co. of America.

Eugene A. March, elected vice president, technology, Crucible Steel Co. of America.

Frank J. Shanaberg, appointed vice president, marketing, American Welding & Manufacturing Co.

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Helical geared Ratiomotors and Reductors – single or double reduction.
For 1/6 to 15 HP drives. Horizontal or vertical base mounted, or shaft mounted.
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Split-Personality Vapors

Dynasoar development might have been stalemated if Boeing engineers hadn't noticed a gray vapor that acted like Dr. Jekyll one moment and Mr. Hyde the next. This split-personality vapor is molybdenum trioxide. It shorts out electrical

VAPOR SHIELD: Help or hindrance?

circuits at 1500°F. However, the same vapor acts as insulation at room temperatures. Boeing plans to protect Dynasoar's electrical systems by encasing all wires in solid-metal sheaths. One mile of this sheathed wire weighs 40 lb.

Tiny Brain Enters Rocket

One-tenth the size and weight of a transistorized computer, a new molecular-crystal brain boasts the same capabilities. The newcomer weighs less than 15 lb. By programming all electrical operations, it will yield more reliable space launchings and bigger rocket payloads.

Harness for Spaceman

An astronaut who repairs a vehicle in outer space will have to wear a harness like a telephone lineman. Even turning a wrench requires up to 75 lb of pressure. That much force in space would send an unanchored astronaut spinning or sailing away from his ship.

"Acid Test" in Space

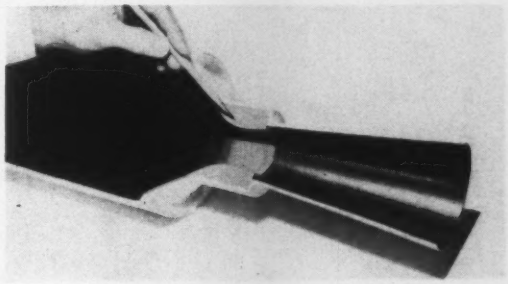
Research on metals for use in outer space received a shot in the arm from the last Discoverer space shot. The Discoverer's capsule, recovered after a 50-hour space ride, contained a number of metal samples. How well these metals stood up on their space trip is now being gaged by Air Force scientists. Aboard the capsule were iron, gold, titanium, bismuth, cadmium, magnesium, nickel and yttrium samples.

Power-Reactor Problems

Looking ahead, reactor progress will cause spiralling radioactive-disposal problems. But the method to deal with these mushrooming headaches may already be on hand. Underwater torch cutting takes advantage of the control medium in pool-type reactors. Just as important, these units can be made small enough to lick the problems posed by hard-to-reach elements.

Dissipates 10,000°F Heat

New heat-resistant compounds and self-cooling methods are being formulated at the Hughes Aircraft Co. These compounds consist of ceramic

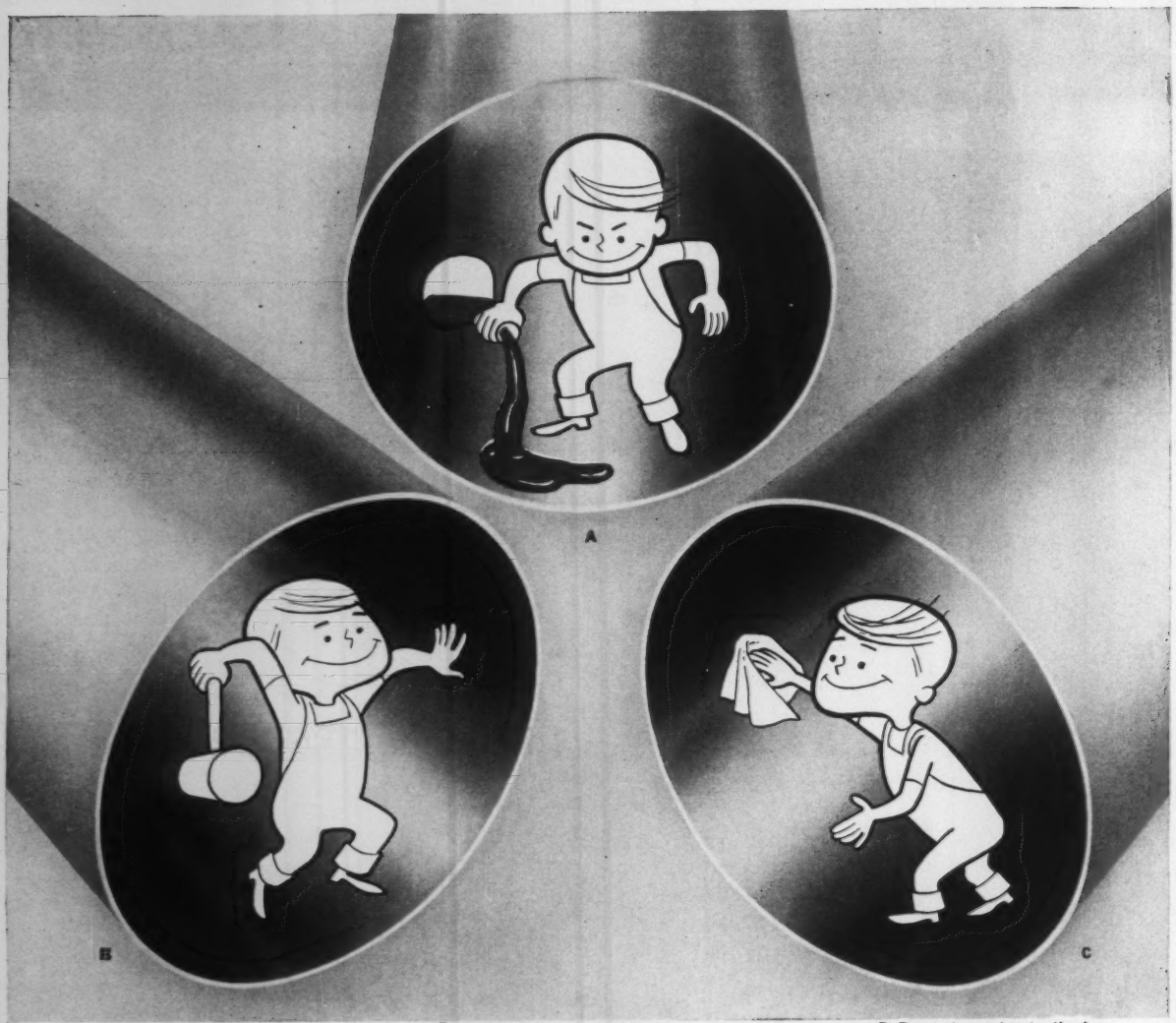


SPECIAL LINING: Improves rocket engines.

and refractory materials plus a polymeric plastic. They're intended for advanced aerospace-rocket motors. Lining critical nozzle-throat areas, the new compounds will allow rocket engines to operate at temperatures up to 10,000°F.

Big Push on Nuclear Engine

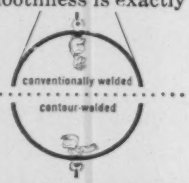
Uncle Sam is speeding up the nuclear-rocket program. One contractor has been chosen to develop a flying version. The Atomic Energy Commission and NASA will ground test this rocket in the fall. Nuclear-rocket engines will serve in deep-space explorations. The first flight tests were slated for 1966. President Kennedy hopes to accelerate this long-range space effort.



A. Defies corrosive attack! B. Resists failure from fatigue C. Prevents contamination!

The "Gravity Kid" shows how
ONLY CONTOUR-WELDING COMBINES ALL THREE BENEFITS IN A SINGLE TUBE

Feel the inside surface of a Contour-welded* stainless tube. It's so smooth you barely feel the weld. Even with a microscope you see fewer crevices and flaws than you find in other makes of tubing. This smoothness is exactly the reason why Contour-welded tubing is so resistant to corrosive attack...to product incrustation ...and to failure from fatigue.



Contour-welded tubing is smoother than other tubing, welded or seamless, because it's welded at the bottom. Gravity pulls the metal down so that the weld corresponds to the inside contour of the tube. There's no bulge on the inside surface. Even on the outside surface, the seam closely conforms to the tubing shape.

Just the opposite occurs in conventionally-weldedtubings. There, gravity pulls the molten metal down into the tube. This can form a bead that is difficult to remove by cold working. And cold working can lead to undercuts that become focal points for corrosive attack, incrustation, and even failure from fatigue.

Contour-welded tubing is smoother than seamless. That's because it's formed from uniformly rolled strip steel, whereas seamless must be produced by extruding or piercing.

But get the full story. Write today for our free 48-page manual, which describes tubing sizes from 1/8" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy, and Hastelloy**.

*Trent's patented process — U.S. Patent 2,716,692

**Trademark Haynes Stellite Co.

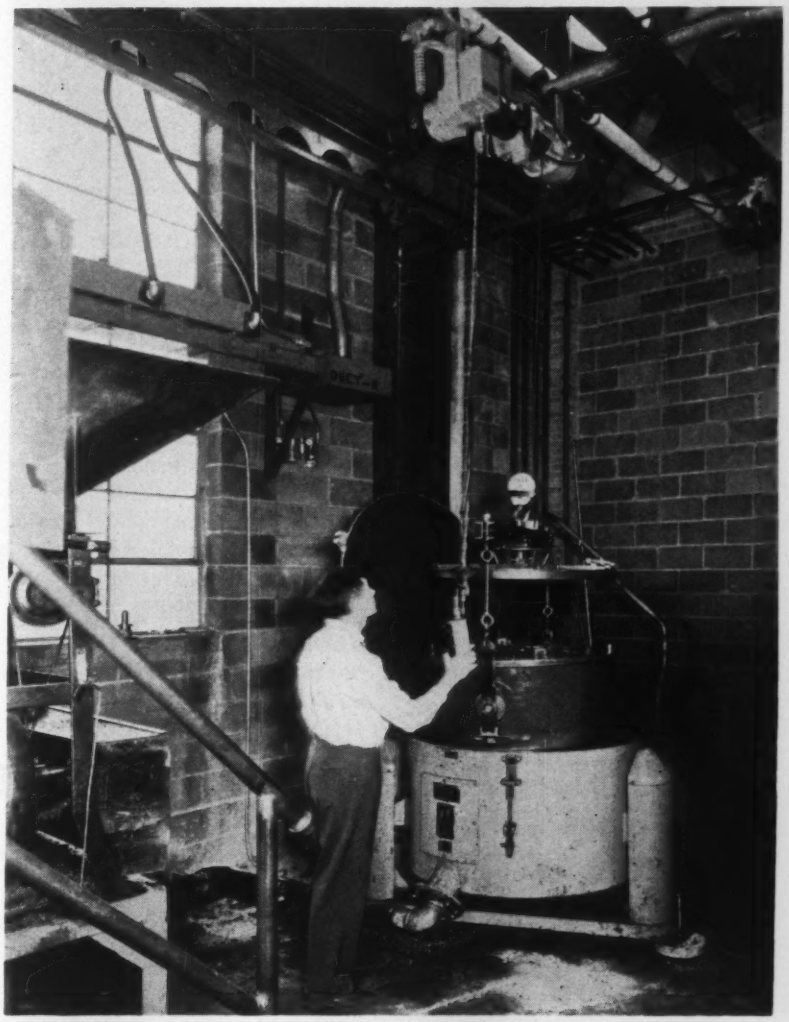
TRENTWELD® Stainless and High Alloy Tubing

Trent Tube Company, a Subsidiary of Crucible Steel Company of America. General Offices and Mills: East Troy, Wisc.; Fullerton, Calif.

Seven Ways to Get Efficiency From Materials Handling

The cost of moving materials involves much more than the price you pay for a lift truck plus the operator's wages.

Here's a set of ratios that takes aim on hidden costs.



SCRAP REMOVAL: A bearing plant uses monorail hoisting setup to remove scrap quickly from centrifuge. System adds speed to the cycle.

■ A great deal of money and effort is spent by industry to obtain more efficient production. Increased mechanization plays a major role. Yet one operation has been sadly neglected. That one area is materials handling.

A typical metalworking plant accounted for the hours consumed by its major operations. Such functions as arcwelding, turning and boring, deburring, plating and punch press work appeared on the list. Do you know that more than twice as many hours were spent on materials handling as on the second most active operation in the plant?

The job then is to attack materials handling and to reduce it to a state of efficiency. It can be done, too. The ammunition you need is inside your own plant. Timing, equipment, waste, methods and labor are all areas for study.

Hidden Costs — Obviously, the cost of moving a part from one point to another should be charged up to materials handling. How about the time it takes to move a part to a machine or a highly skilled worker? Until the part arrives at its destination, the idle time for the machine or the worker is also charged up to materials handling.

Someone from management, an engineer or even a foreman can jot down the needed data during a tour of the plant. These data can then be worked into simple ratios. From these ratios you can tell which areas of your materials handling system need updating.

The ratios themselves have been prepared jointly by J. R. Bright, director of the Industrial Management Center, Lake Placid, N. Y., and the Yale Materials Handling Div. of The Yale & Towne Mfg. Co., Philadelphia.

Labor Factor — The first ratio

COMPACT DESIGN: Maneuvering through narrow aisles of a machine shop is much easier if truck has compact dimensions. Parts can be delivered quickly to machine location within easy reach of the operator.

deals with this basic question: How big is the materials handling operation in your company? To find the answer, first compute the total wages earned by workers who are employed entirely in moving materials.

Of course, other workers are also engaged in materials handling from time to time. You can obtain this figure by multiplying a realistic portion of their wages to pro-rate time spent in materials handling.

Once you get a total of both full-time and part-time wages, divide this sum by the total wages of the whole workforce. This will give you the materials handling labor ratio.

What's Ideal? — Certain companies are bound to have higher ratios than others. In metalworking, for example, a labor ratio of 40 pct would be extremely high. Five percent would be very low. If your ratio is 20 pct, it could mean there's room for improvement. On the other hand, an ideal ratio might be 10 pct.

A manufacturer of oil well equipment has already put these ratios to the test. This company shows annual savings of $18,000 solely in the shipping and the inspection of bar stock.

P. R. Hartig, vice president of Yale & Towne, points out that materials handling accounts for between 20 and 30 pct of a product's cost while adding nothing of value to the item. Now, he asserts, industry has a tool (the seven ratios) with which it can rid many of the elusive costs attributed to handling materials.

Working Proof—An electronics company found that 56 pct of its payroll in 13 plants went for materials handling. An aggressive attack on the causes reduced the ratio to 25 pct. The ratio, therefore, merely serves as a starting point for before-and-after studies. It can also show you just where you stand in your own industry.

Is Direct Labor Lost to Handling Chores?

Department	Observations made on operator	Time spent on handling, pct	Number of operators in dept.	Annual payroll of dept., $	Estimated direct labor payroll spent on handling, $	Estimated savings through better handling, $
A	1	10	18	120,000	12,000	3000
B	6 9	12 15	30	180,000	21,600	6000
C	12	8	7	48,000	3840	none
D	15 22 31	18 21 17	42	256,000	46,080	25,000
E	41	6	8	51,000	3060	1000
				655,000	86,580	
					TOTAL FEASIBLE SAVINGS	$35,000

TENTATIVE CONCLUSIONS:

1. Direct labor handling loss ratio is $\frac{86,580}{655,000}$ = 13.2 pct (quite low).
2. Still after a critical study of each department, improvements in materials handling could save $35,000 per year.
3. Department D needs special attention.

Ratios Reveal Hidden Costs

Materials Handling Labor	=	Materials Handling Labor / All Labor
Direct Labor Handling Loss	=	Materials Handling Time Lost by Direct Labor / Total Direct Labor Time
Movement/Operation	=	Total Number of Moves / Total Number of Productive Operations
Manufacturing Cycle Efficiency	=	Sum of All Production Operation Cycle Times / Elapsed Time in the Production System
Space Utilization Efficiency	=	Cubic Feet Usefully Occupied / Net Usable Cube
Equipment Utilization	=	Actual Output / Theoretical Capacity
Aisle Space Potential	=	Current Aisle Floor Space Minus Theoretical Optimum Aisle Floor Space / Current Aisle Floor Space

Are highly skilled workers ignoring their main jobs to move materials? If this is the case, is it because handling techniques and equipment are not up to par? This is the goal of the second ratio. If your figure runs 15 pct or more, it's a warning that your direct labor handling costs are getting high.

The third ratio tackles the problem of whether there are too many handling actions. This figure is obtained by dividing the total number of moves by the total number of productive steps. How many operations are required before an item is processed through the plant?

Problem Point—The workplace can be a key problem spot. Here materials are picked up and put down several times. At stations where a sequence of work tasks is done, much unnecessary handling often occurs. Another trouble spot is the end of a mechanized production line.

Don't overlook temporary delays. They can cause unneeded movements. Don't omit some movement just because it happens to be mechanized.

On this score, a 4-to-1 ratio is a good target for a job shop. Conveyorized systems should shoot for 3-to-1, or better. Studies in 14 small-to-medium size plants have shown a surprising cluster around 7-to-1 ratios.

Is It Effective?—Ratio No. 4 will tell you how effectively the production system executes the manufacturing order. This is called manufacturing cycle efficiency. Very few job shops will show an efficiency of even 10 pct. At some plants studied a few years ago, efficiency ratios were fractions of 1 pct.

There are many factors which cause low cycle efficiency. Where work piles up at a machine station, can added equipment be installed to relieve the bottleneck? Are the materials traveling too far? If they are, perhaps a few changes in plant layout might solve this problem.

Check into communications, too. Materials may be delayed because paperwork is late. Sometimes a major cause of delay can be traced to one department or machine.

Usable Space—The fifth ratio measures how effectively your enclosed space is used. To compute it, divide the cubic footage now in use by the potential amount of usable space. Naturally, such areas as columns, stairwells and clearances in front of doorways and docks must be deducted from potential usable space.

A 60 pct space ultilization efficiency for a warehouse is good. Of course, this figure will be lower where quantity of each item is small and many items are involved.

Management always wants to know whether a costly machine is running efficiently. The best way to find out is through the equipment ultilization ratio. It's computed by dividing actual output by theoretical capacity.

Prime targets for this ratio are machines that are (1) major factors in production activity, (2) marked by heavy investments, and (3) victims of bottlenecks. Hours should be compiled over at least a day, if not a week.

The Big Change—In the days of pre-automation, an auto plant would hit about 60 pct. With automation, engine plants moved up to around 80 pct. Some steel mill rolling plants are up to 85 pct. Job shops, however, often drop to a poor figure of 40 pct.

The final ratio takes up the problem of aisle space. Here improved pieces of handling equipment might allow for narrower aisles. There are cases where increases of 40 pct have been picked up from aisle space alone.

You must check to see if the aisles are in the right places. Also, how many unnecessary aisles are there?

The ratios as a whole reveal the trouble spots in your plant. It's then time to apply corrective measures to insure efficiency. What simpler way is there to cut costs?

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Vectors Define Casting Flaws

Overall Magnetization Speeds Nondestructive Tests

Even minute flaws can cause serious damage in steel castings weighing up to 25 tons.

Every flaw must be found and carefully evaluated before any casting leaves the foundry.

■ For years, 100 pct inspection of large castings has caused production bottlenecks in steel foundries. Conventional inspection methods prove costly and time consuming. Too often, they fall far short of desired reliability goals.

But there's a way to solve these inspection headaches. A new nondestructive testing machine at the Birdsboro Corp., Birdsboro, Pa., reduces magnetic-particle inspection time on large steel castings from days to hours. At the same time, it greatly increases the reliability of all test results.

Vector Analysis—The new machine was built by the Magnaflux Corp., Chicago. It employs a vector method of overall magnetization in conjunction with a fluorescent wet-inspection medium.

One of the newcomer's first uses at Birdsboro centers on testing 2600-lb low-alloy steel castings of gear-type design. These parts create inspection snags whenever conventional cross-prod and dry-powder methods are used with portable test units.

Small internal fillets and tiny core openings contribute to the problem. Previously, it was necessary to operate two machines on an around-the-clock seven-days-a-week basis. Two operators manned each of these portable testers.

Six to seven manhours were needed to give each large casting the once over. An average of nine full inspections per casting were commonplace.

BLACK LIGHT: Fluorescent wet-inspection medium pinpoints any defects which might exist in small internal fillets and in tiny cored openings.

Fatigue Factor—Of course, operator fatigue was part of the problem. Other factors that affected test results were: Non-coordination of personnel while prodding and applying Magnaflux powder; and overheating of prod handles and cables caused by continuous operation.

Faced with this production-testing snag, Birdsboro decided that new equipment was a must. The company purchased an 8000-amp Magnaflux tester that handles castings weighing up to 25 tons. This machine's capacity is adequate for sectional or overall magnetization of all types of ferromagnetic castings.

With the new test equipment, the choice of a magnetizing method depends on the casting's shape. Over-all magnetization takes place when separate currents are directed through three circuits.

Size and Location — Why use three currents? Only one magnetic field may exist at one time in a part. However, by cycling three-way magnetization in three planes the machine sets up vector-magnetization fields.

After using the new equipment for one month, S. W. Gearhart, chief metallurgist at Birdsboro, reports: "Magnetic-particle inspection of each gear-type casting now takes less than 20 minutes. And one man does all the work.

"After attaching cables, the op-

erator sprays and magnetizes the casting. Then," says Mr. Gearhart, "he uses a black light to probe for defects."

No More Backlogs — Projected savings at the present rate of production testing show a payoff on the new equipment in less than nine months. Work backlogs at the magnetic-particle test station no longer exist.

Tests now average three or four per casting compared to the previous average of nine. Thus, the number of manhours used to inspect a casting has been slashed by more than 90 pct. These total-time savings don't reflect overtime and shift premiums paid under the previous method.

The new unit consists of self-contained electrical circuitry in a heavy-duty cabinet. Six copper bus bars extend from the front of the cabinet. These bars form the terminals for the three separate external-magnetization circuits.

Flexible Cables—Each external circuit has two 15-ft long 1,000,000 circular-mill cables. These high-amperage cables boast good flexibility. Using a selector switch, the operator obtains single-shot two- or three-way Duovec operation.

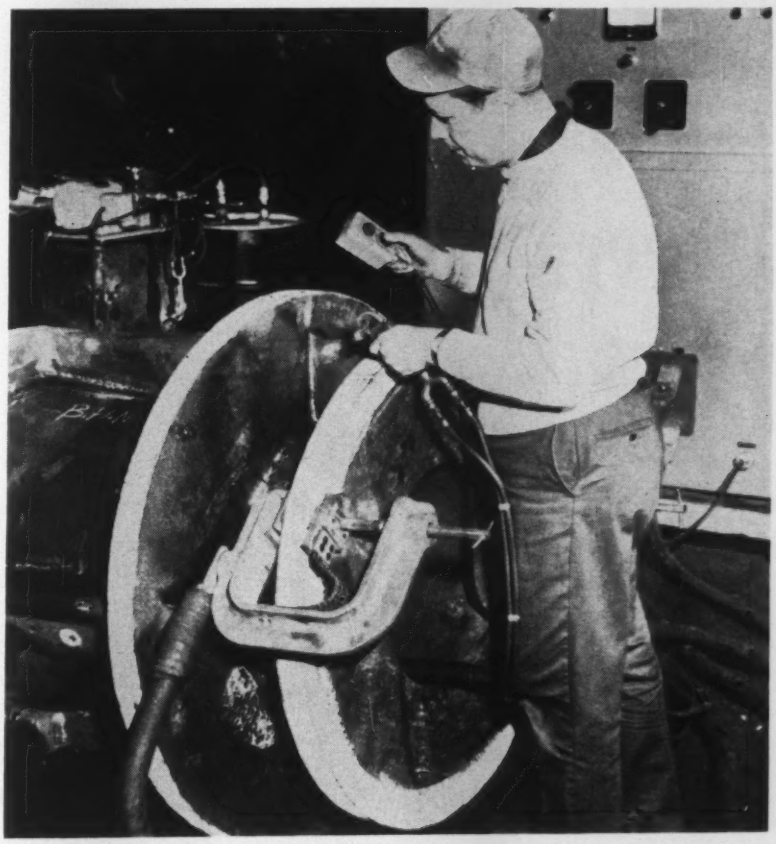
Two transformers on the cabinet permit stepped regulation through 500-amp stages. Tap switches on these transformers control each of the magnetizing currents.

For continuous magnetization, the operator sprays the casting surfaces with No. 20 Magnaglo. He uses water as the suspending agent. Water flow is regulated by a drum-agitated spray system. This system consists of a 55-gal drum, a pump agitator and a dual-pressure pump.

Black light facilities inspection. This fluorescent wet-inspection method offers many cost advantages. There's no recovery problems with the water-vehicle medium.

During inspection, the operator presses a remote-control button as often as necessary to completely spray the casting surfaces. The water-base solution also contains a rust inhibitor and a wetting agent.

PAIRED CONNECTIONS: Operator clamps two exterior cables on a casting. Each paired connection forms a separate external-magnetization circuit.



CONTINUOUS MAGNETIZATION: During the continuous-magnetization period, which the operator controls with a remote switch, he freely sprays the casting surfaces with Magnaglo. Water serves as the suspending agent.

System Gages Complex Parts

Programmed Unit Relies On Built-In Five-Axis Gaging

Would you believe that a 16-ton system can gage millionths-of-an-inch measurements?

It can. And its speed is more than 60 times faster than conventional techniques.

■ The climax of critical fabricating jobs comes at the end. Does the part meet spec? This question can only be answered by the metrologists, the men who gage the accuracy of the part.

It takes a long, long time to make the required measurements on a nose cone. Conventionally speaking, it would take about a month. Now a new gaging system is available which can perform this same gaging cycle in just two hours.

The system consists of a giant, 16-ton gaging unit that is commanded by a roll of punched tape. Made by the Sheffield Corp., Dayton, it's designed to make inside, outside and thickness measurements on parts of any shape. Tolerances can be gaged to a millionth of an inch.

OPERATION WATCHDOG: New machine automatically measures and prints out at the same time deviations down to millionths of an inch.

Five Axes—One of the big features of the system is its ability to perform five axes of motion. The workpiece moves horizontally and it also rotates. The outer gage stylus moves both vertically and horizontally, while the inside stylus moves vertically.

Three modes of gaging are provided. One is numerical-control scan gaging. Another is numerical-control increment gaging. Still a third mode is control by the operator.

In scan gaging, the part is rotated slowly under numerical control. If an out-of-tolerance point is discovered, rotation stops. The deviation, whatever it is, is then printed out. This same sequence continues until deviation is within allowable limits. Then the scanning cycle resumes.

When increment control is used, the rotary table, under tape control, advances a preset amount. When it stops, deviation and position are printed out. Deviations within preset limits are printed in black while those outside the limits are in red.

Writes the Manuscript—In the third mode the operator sets up all the conditions that would normally be included in tape command. Such gaging permits a part of unknown dimensions to be explored and slide dimensions printed out. Data obtained then become the manuscript tape for reproducing the part.

What is included in the Sheffield system? Half of the weight is in its one-piece gage base. Other equipment consists of vertical and horizontal slides, a rotary table, Bendix numerical-control unit and a console that contains the gaging and amplifying circuit. You'll also find readout meters along with an automatic printout system.

The rotary table is mounted on

the horizontal slide. This table carries the holding device for the workpiece. The vertical slides carry the gaging styli. Separate slides are used to guide both the inside stylus and the outer stylus.

Concave or Convex—Let's study an actual case in point. The part in question is a hemisphere. This part must be inspected for outside contour, inside contour and wall thickness. All of these areas have to be checked at each two degrees latitude and 60 degrees longitude.

To complete this job, 795 readings are needed. Included are 265 mathematical computations for wall thickness. The new system can complete this task and provide a printed record of all data in just about two hours.

If you checked the same part using conventional methods, it would probably take more than 125 hours. Aside from the time lag, it's doubtful that your results would be nearly as accurate.

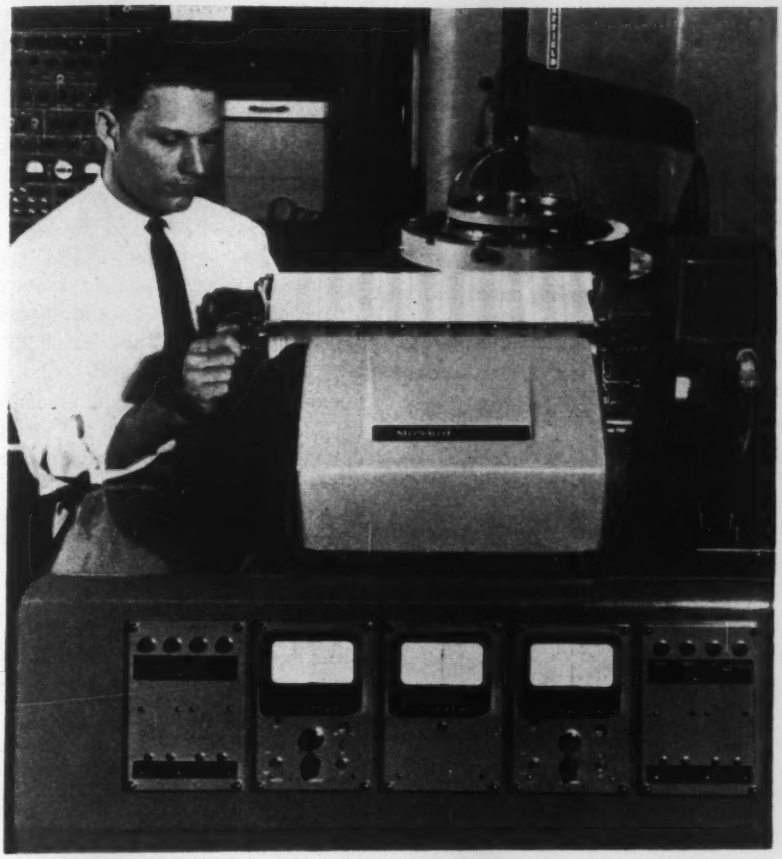
Double Probe—The part to be gaged is mounted on the rotary table. Then two slide-mounted, rotating-ball cartridges go into action. In this way, both inner and outer surfaces are gaged at the same time.

Due to the nature of the contact, you can tram an angle with a higher degree of accuracy than is possible with a gage cartridge having a fixed stylus.

The machine can inspect workpieces up to 20 in. high by 20 in. in diameter. Minimum inside radius of work is 2 in.

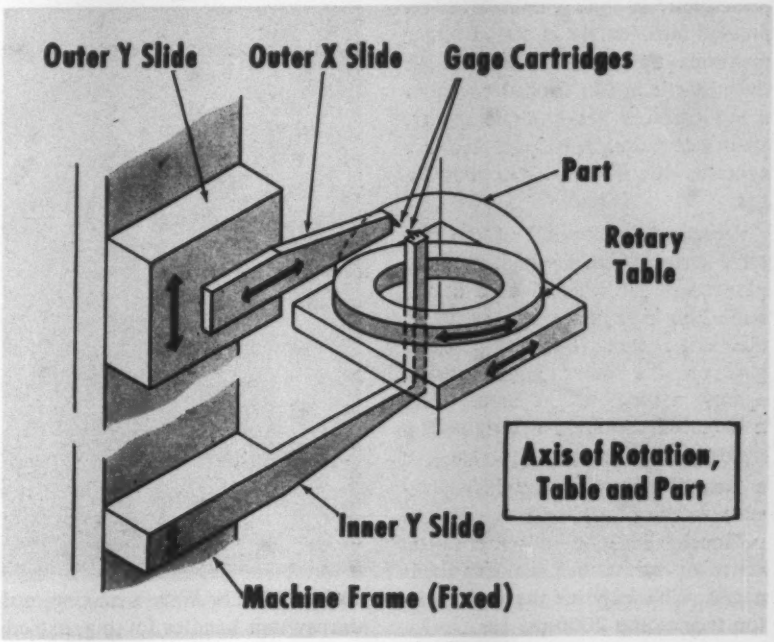
Riding the Range—The setup will measure any point or angle within the 20-in. gaging range to an accuracy of 0.0001 in. Over a range of 20 in. the machine has a repeatability closer than ±0.000005 in.

Wall thickness can be measured to an accuracy of 0.00005 in. All slides operate within 15 millionths of an inch of true position. Accuracy of positioning can be calibrated within ten millionths of an established master.



INSTANT READINGS: The gaging record is up-to-date at all times. Each time the stylus spots a deviation, the recording is printed out.

Designed to Cover All Points



Gas Powers Metalforming Giant

Artillery-Recoil System Dampens 431,000 Ft Lb Shock Load

At 2000 psi, a high-pressure gas fires the piston on a huge vertical drop-forming machine.

Even exotic metals flow inside the shaped dies as 1500-ips ram velocities exert controlled shock pressures.

■ For several months, the American Brake Shoe Co. has been conducting tests on the world's largest vertical high-energy-rate forming machine. These tests at the company's Mahwah, N. J., Research Center include forging, compacting, extruding, blanking and other studies.

With a ram velocity of 250-1500 ips, the new forming machine is about 100 times faster than any high-speed extrusion press. Called the Dynapak 1810, this metalforming giant was made by General Dynamics Corp.

Pressurized Gas — Dynapak's operation is based on pneumatic principles. In one chamber, compressed nitrogen gas is stored under pressures up to 2000 psi. When the piston's in the cocked position, a low-pressure gas holds it against an orifice plate. A second chamber contains the low-pressure 200-psi gas.

One seal isolates all of the piston's surface from the high-pressure gas except for a small area at the seal. The high-pressure gas acts on this small area. The low-pressure gas, on the other hand, pushes against a much larger area. Thus a balanced condition is obtained.

When Dynapak's ram is triggered, a small buildup on the high-pressure side of the seal upsets the balanced condition. As the piston starts to move, the seal is disengaged. This exposes the entire piston face to the 2000-psi gas.

Variable Speeds—The high-pressure gas fires the piston at velocities up to 1500 psi. Forming speeds hinge on the piston's size, the pressures employed in the two chambers and the ram's weight.

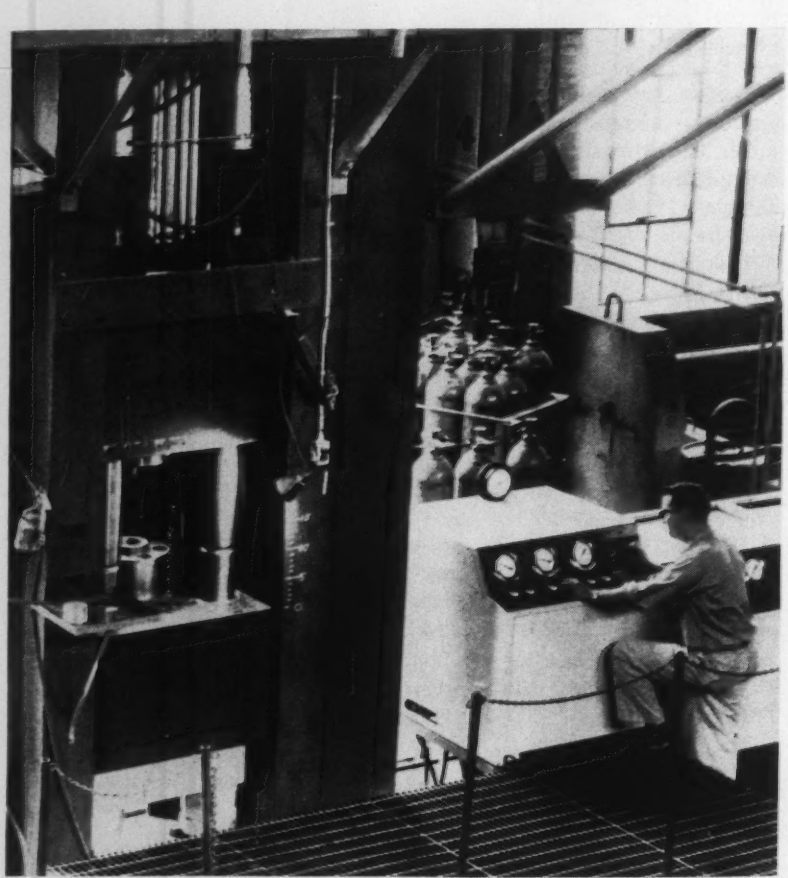
One die or punch is mounted on the ram, its mate is seated in a bolster. After the machine fires, a hydraulic pump resets the piston. This pump also recompresses the nitrogen in the high-pressure chamber.

A full working cycle—cock, release, reset—takes only 105 seconds. Stroke length is 15 in. Maximum energy is 431,000 ft lb.

Dampens Shock — To dissipate such tremendous energy, conventional machines require a large foundation. But Dynapak uses a self-reacting system. This feature works on the same concept used in artillery recoil. When the piston's released, its heavy cylinder and tie rods move slowly in the opposite direction. This momentum counteracts the piston-stroke mass.

With the self-reaction feature, there's almost no impact loading on the plant floor. Imbedded in concrete, a few bolts hold Dynapak in position.

Thus far, metallurgists at the



MANY USES: With a maximum die size of 22.5 in. in diameter, the high-energy unit handles forging, extruding, compacting and blanking tasks.

American Brake Shoe Co. have formed complex parts out of aircraft-quality Type 4130 steel, tough-pitch copper and copper-powder compacts. Dynapak can also shape exotic metals such as tungsten, molybdenum, titanium, columbium and zirconium.

Single-Shot Forming—Let's check out a case in point. Cone-shaped piston caps for hydraulic landing-gear struts were formed out of 2 x 2 in. 4130-steel billets. Each billet was first heated in a salt bath to 2150°F.

A graphite-and-water solution is used to lubricate both forming-die sections. This keeps the hot-forged parts from sticking to the punch or in the die.

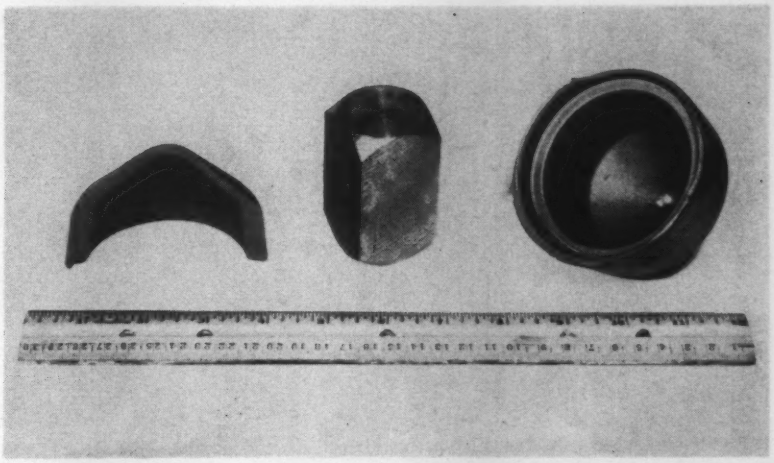
With a single stroke, each of the steel caps is formed to exact dimensional tolerances. Weighing 1.75 lb, each cap has a wall thickness of 0.175-0.185 in. Concentricity is ±0.010.

On every part, there's almost no scrap loss. And each surface finish is superior to that obtained by normal-forging methods. Machining in a lathe trims off a small amount of flash which is forced into a thin ring at the cap's outside edge.

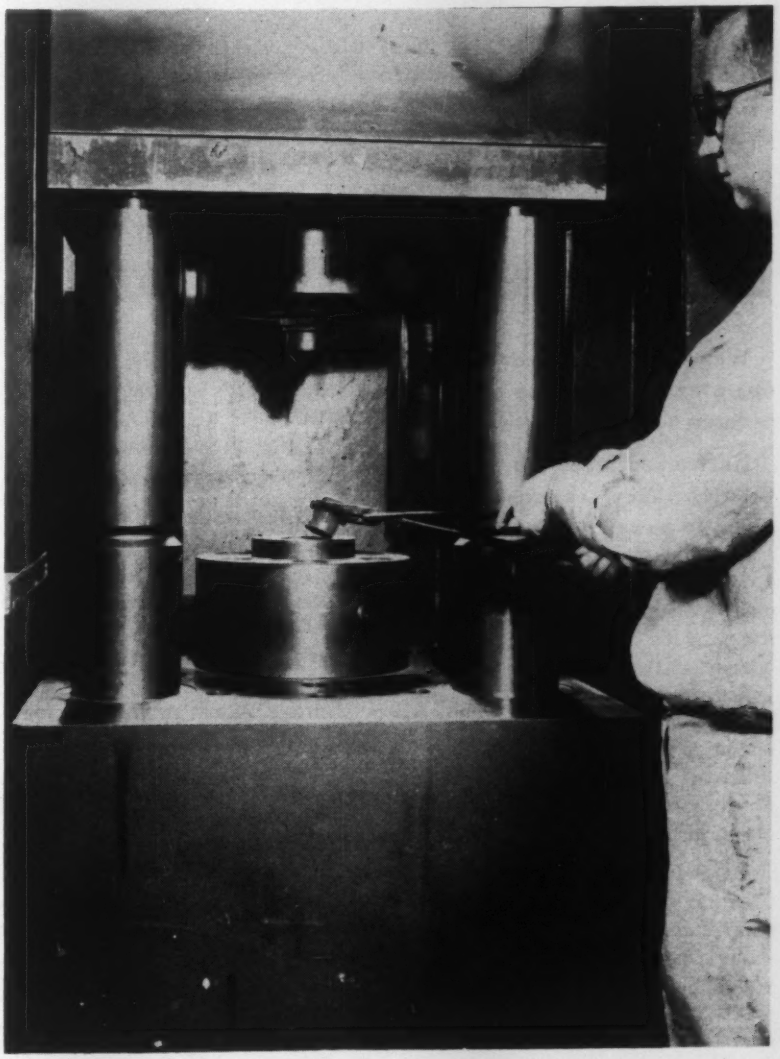
Saves Five Strokes—Using conventional press-forging equipment, this same part calls for at least four forming-press strokes, followed by a session on a cold-trim press. Then it would still need inside and outside machining to meet customer specifications.

Dynapak's high ram velocities create abrupt pressures inside the die cavity. These pressures cause severe deformations. Even tough, hard, or brittle materials exhibit a plastic behavior when they're hit by the high-speed ram. These hard-to-shape materials flow smoothly and evenly into every die opening.

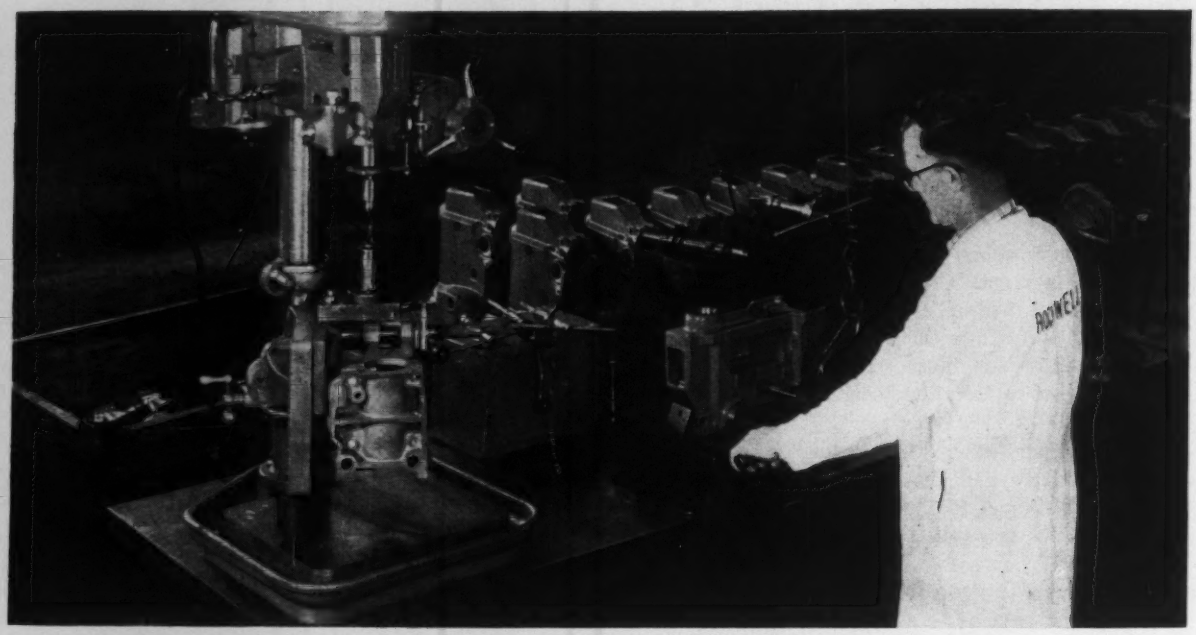
The punch remains in the die for such a short time that there's no overheating problem. Maximum dwell time is one second. Forming pressures are applied and released so quickly that each part is completely formed before the die has a chance to deform beyond recovery.



BILLET TO CAP: Cone-shaped piston cap (right) was formed in a single stroke from a hard steel billet. The cutaway view shows wall section.



HEAT AND SERVE: Each billet is heated to 2150°F, then it's inserted in the stationary die. As-formed wall thickness is held to ±0.005 in.



TWO IN ONE: In this application, the operator reams each newly-drilled casting with a portable-electric reamer. At the same time, the power-feed drill press automatically drills the casting next in line.

Drill Presses Need Power Feed

Why does today's drill-press operator use the same old procedures he's always used?

Hackneyed ideas may be the culprits. They checkmate the swing to power feeding.

■ The drill press is the most-common tool in industry. There are reasons. It's low in cost, easy to operate and adaptable.

But, while precision and capacity improve over the years, method of operation stays the same. You position the work and pull the spindle down, just as the operator of the first drill press did.

Behind the Times — Here's a situation that bucks the trend toward industrial mechanization. It stems from hoary assumptions. If you believe that: Productivity depends on feed rate; mechanized feed creates idle process time; mechanical feed is unreliable; and drill presses don't lend themselves to automation anyway; why go further?

Instead, let's start at the beginning and take a good hard look at these common stumbling blocks. If they prove false, we may have a case for power feeding.

Valid Data — The results of a study made by Rockwell Mfg. Co.'s industrial engineering department offer support. Findings indicate power feed pays off, even on intermittent runs.

During actual production jobs, tests pinpointed feed rates and drilling times on manually-operated presses. These were compared with powered performance. The comparison convinced Rockwell's plants. They're switching to power feed.

Let's see what the study shows. In the first place, no operator can hold the right feed rate for holes larger than ¼ in. The same applies for smaller holes at high speeds.

However, power feed is constant. You simply set it at the right rate. Because of this, power feed improves drill life and work quality. True, power feed produces idle-process time. But, you can get around this drawback by assigning another spindle to the operator.

The Speedup—Charts, developed by the study, point out that an operator maintains a feed of only 0.004-0.006 ipr, or less, as spindle speeds go up. The advantage of power operation at a conservative 0.006 ipr mushrooms to 600 pct for a ¾-in. hole at 200 sfpm.

Even with a slower cutting rate the difference is impressive. At 100 sfpm, hand-feed drilling a ½-in. hole 1-in. deep takes 23 seconds. Power feed slashes this time to 13 seconds at 0.006 ipr. With a 0.009-ipr feed rate, nine seconds is all it takes. Of course, multi-spindle setups magnify the advantages.

Today in the metalworking industry, ignoring automation is fatal. Drill press operations are surely ripe for it. Power feed may supply another boost to productivity.

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NEW PATENTS

Separates Solids

Centrifugal method and apparatus for separating solids, V. Rakowsky, Apr. 18, 1961. An improved centrifugal apparatus and method concentrates mineral values occurring in ores containing objectionable gangue materials. An example is beneficiating siliceous Mesabi ores. Canadian 618,372.

Steel Manufacture

Manufacture of steel, T. C. Churcher (assigned to British Oxygen Co. Ltd., London, England), Apr. 4, 1961. In the manufacture of steel, fine streams of molten iron contact a mixture of steam and an oxidizing gas. Gas from the reaction zone recycles to the bottom of the shaft furnace. The waste gas is used for steam production. Canadian 617,839.

Iron-Ore Pellets

Pelletized, iron-ore concentrate, F. D. DeVaney (assigned to P. M. Associates, Apr. 18, 1961. Hard, microscopically - porous, iron - ore pellets result from mixing ore fines with a flux such as dolomite or limestone and a fuel. Then, the mixture is pelletized. Indurating the pellets at 2000-2400°F. causes slag bonding. Canadian 618,640.

Makes Nodular Iron

Methods of producing nodular iron, L. C. Crome (assigned to The Dayton Malleable Iron Co.), Apr. 18, 1961. In the production of nodular-iron castings, where the nodularizing agent is rare-earth metals, the molten gray iron is treated with calcium-carbonate slag material, carbon, and fluorspar. Further treatment consists of adding a fluoride of rare earths along with calcium silicide as a reducing agent. U. S. 2,980,530.

Degasses Steel

Improved vacuum degasification of steel (assigned to Bochumer Verein fur Gussstahlfabrikation A. G., Bochum, Germany), Mar. 15, 1961. This process filters out the pyrophoric dust in the gases. The filter is treated with dry clay or asbestos to deactivate the dust so it will not burn during subsequent ventilation of the filter. British 863,167.

Adds to Furnace Life

Improvements relating to the manufacture of steel in a rotary furnace (assigned to A.R.B.E.D., Soc. Anon., Luxemburg, Luxemburg), Mar. 29, 1961. In the manufacture of steel in a basic lined-rotary furnace, pig iron is refined by an oxidizing gas injected from above the bath. A gaseous suspension of lime or limestone enters from above onto the furnace lining or onto the outer edges of the surface of the melt. This lengthens refractory-lining life. British 863,803.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

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Hydraulics Unlimited

A compresentive catalog covers every requirement for a complete hydraulics installation. It includes hand pumps, hydraulic pumps, standard and heavy-duty pressure switches, relief valves, gages and a full line of cylinders. There's also a complete section devoted to accessories. (Oil-Dyne, Inc.)

For free copy circle No. 1 on postcard

New Chain Ideas

Here's a gold mine of thought-provoking suggestions for the design engineer searching for new ideas in motion, conveying, bearing surfaces and couplings. Presented in file-folder form, the new literature outlines ways and means of employing chains to reduce production costs and increase operating efficiency. (Atlas Chain & Mfg. Co.)

For free copy circle No. 2 on postcard

Motor Rotors

A technical paper on automated motor - rotor post heating and shrink fitting is now available. It discusses the reasons why these processes upgrade rotor efficiency and quality. (Selas Corp. of America)

For free copy circle No. 3 on postcard

Polyester Structures

"Design Considerations for Applying Reinforced Plastics in the Corrosive Environments of the Process Industries" is an 8-page study of the subject. It presents a table for estimating the degradation of tensile strength in reinforced-polyester laminates under 14 practical service and production conditions. (Atlas Powder Co.)

For free copy circle No. 4 on postcard

Welding Problems?

A new 8-page folder contains case-history reports on how three user companies benefited from the use of special electrodes and wires. It may point the way to savings in your plant, or help solve one of those knotty "special" cases. (Electrode Div., The McKay Co.)

For free copy circle No. 5 on postcard

Electrical Plugs

Emphasizing safety features, a new bulletin describes the features of a 60-amp power plug. The plugs connect with the most widely-used power receptacles. No special adapters are needed. (Electrical Products Div., The Joy Mfg. Co.)

For free copy circle No. 6 on postcard

Photocells in Action

An Industrial - application leaflet contains a comprehensive report on typical production problems solved with electric eyes. Photographs and sketches ilustrate the various applications. (Photomation, Inc.)

For free copy circle No. 7 on postcard

Metal-Hose Guide

Data to help the engineer select the right flexible-metal hose and design it into each specific installation are now available in a new 32-page illustrated guide. (Atlantic Metal Hose Co.)

For free copy circle No. 8 on postcard

Protective Plastics

Polyethelene caps and sleeves safeguard threaded shafts, drill pipes and other products and com-

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FREE LITERATURE

ponents of relatively-large diameter or odd shape. A new bulletin sets forth some design possibilities for these caps and sleeves which can be molded in practically any shape or depth at low cost. (Protective Closures Co., Inc.)

For free copy circle No. 9 on postcard

Meehanite Dies, Molds

A new 16-page brochure presents a strong case for Meehanite dies and molds. It explains and analyzes the many properties which make Meehanite a good choice. Included are numerous photographs of outstanding applications. (Meehanite Metal Corp.)

For free copy circle No. 10 on postcard

Heat-Transfer Units

A new literature release tells about heat-transfer equipment for special applications. The units consist of two sheets, embossed and welded together to form passages for heating or cooling media. They can be tailored to satisfy a broad range of process heating and cooling needs (Platecoil Div., Tranter Mfg., Inc.)

For free copy circle No. 11 on postcard

Monitors Pollution

Instruments, that accurately measure and record minute concentrations of contaminents in the atmosphere, are the subject of a recently - released bulletin. Several models are described. (Scientific & Process Instruments Div., Beckman Instruments, Inc.)

For free copy circle No. 12 on postcard

Semiconductors

"The Way to Better Semiconductor Production," a new 20-page booklet in color, describes and illustrates many pieces of equipment built for the precision control of semiconductor production. It also discusses research and design services that are available. (Lindburg Engineering Co.)

For free copy circle No. 13 on postcard

Meters Radiation

In 16 pages, a new catalog concerns itself with a line of nuclear-radiation survey meters and dosimeters. Each model in the line is illustrated and described in detail. The literature also includes ranges, uses, performance figures, ratings and other pertinent data. (The Victoreen Instrument Co.)

For free copy circle No. 14 on postcard

Tools and More Tools

This general catalog illustrates and describes a comprehensive line of tools for plants, shops and contractors. Included in its 132 pages are tool holders, setup and hold-down tools, tool bits, machine shop specialties, wrenches, socket wrenches, wrench sets, miscellaneous hand tools and pipe tools. (Armstrong Bros. Tool Co.)

For free copy circle No. 15 on postcard

Better Than New

Plant production men, increasingly concerned with reducing upkeep costs, will be interested in a 6-page booklet entitled "How to Save Money and Cut Downtime with Metallizing." Examples cover flame spraying with metals in both wire and powder forms, cite dollar savings. (METCO Inc.)

For free copy circle No. 16 on postcard

Wrought Iron in Use

A new 8-page folder, "Wrought Iron for Sewage Plants and Manhole-Ladder Steps," points out advantages and describes several installations. (Engineering Service Dept., A. M. Byers Co.)

For free copy circle No. 17 on postcard

Stainless Steel

Colorful and attractive, a new booklet describes the facilities, services and products of a company which produces stainless - steel sheets, plates, coil and strip exclusively. It's designed to be a ready reference for steel service centers, fabricators, and the many industries that require a knowledge of the properties and the many types of stainless steel. (Eastern Stainless Steel Corp.)

For free copy circle No. 18 on postcard

Laying Brick Floors

Complete illustrated information on brick-floor installation features the preparation of corrosion-resistant and wear-resistant joints to reduce costly upkeep. The details are found in a 4-page publication which also points out other money-saving techniques for the proper installation of new brick floors. Special non-shrink grout is the key. (The Master Builders Co.)

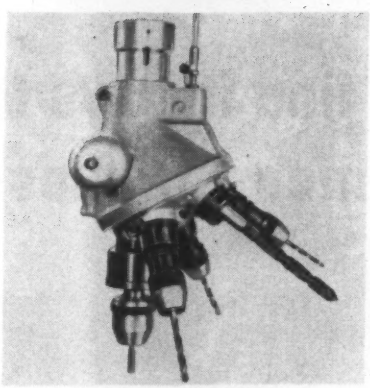
For free copy circle No. 19 on postcard

New Materials and Components

Welded Construction Slashes Tubular-Roll Costs

A tubular roll with welded ends downgrades tolerance requirements during manufacture. Inexpensive parts weld together, then an overall-finishing operation brings the roll to size. Cost savings are the result. With this process, shaft strength is more than adequate for common loadings. Also, the basic roll weighs less. Since tooling costs are low, small-quantity prices don't stun the buyer. The rolls come in steel, brass and aluminum. Diameters range to 18 in.; lengths to 18 ft. (New Hudson Corp.)

For more data circle No. 20 on postcard, p. 79



Multi-Spindle Head Converts One-Spindle Presses

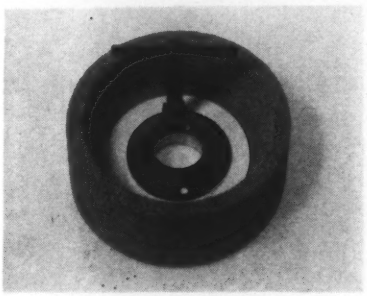
Any vertical, single-spindle drill press may now play a double role. With the aid of a new indexing-turret drill head, these presses take on automatic multi-spindle operations. This means workpieces get complete machining at a single setup. The newcomer handles 2-5 tools. All spindles are quickly interchangeable. These features, coupled with the eight spindle speeds available, put more productivity at your fingertips. Although all work spindles have Morse and Jacobs tapers with suitable drilling and tapping chucks, special tapers are available on request. Another feature is quick speed changes. Also, no reversing of the drill spindle is necessary during the tapping operation. For drilling, capacity is ⅛-in.; for tapping, it's ⅛-15/16 in. (The Jersey Mfg. Co.)

For more data circle No. 21 on postcard, p. 79

Castings Employ Low-Alloy, High-Strength Steel

An established metalworking company now produces castings from United States Steel Corp.'s "T-1" steel. In the photo, company officials discuss betatron X-ray equipment that will check the soundness of heavy castings made from "T-1." These castings represent a new tool for improving the performance and operating economy of many types of industrial equipment. In its rolled forms, "T-1" steel is a proved engineering material, noted for its strength and field weldability. The new cast forms boast the same useful high-strength properties. (Esco Corp.)

For more data circle No. 22 on postcard, p. 79



Unit Mounts Grinding Wheels, Replaces Spanners

Here's an attachment that mounts grinding wheels on all types of surfaces, cutters and grinders. Before, machine operators had to pound on spanner wrenches to tighten or loosen ordinary grinding-wheel locks. Many times, the wrenches slipped off and cracked expensive grinding wheels or split knuckles. With this new unit, you simply set the grinding wheel in position on the spindle. After sliding on a special washer, start the threads with the fingers. Then use the key wrench to tighten it down. The unit especially suits recessed grinding wheels. (Headbloom Products, Inc.)

For more data circle No. 23 on postcard, p. 79

Get stainless today from these steel service centers:

New steels are born at Armco

(A) Sheets, Strip and Plates (B) Bars and Wire

AMERICAN STEEL & ALUMINUM CORP. (AB)
Hartford, Conn.

AMERICAN STEEL & ALUMINUM CORP. OF MASS. (AB)
Cambridge, Mass.

BROWN-WALES COMPANY (AB)
Cambridge, Mass. – Auburn, Maine – Worcester, Mass.

CENTRAL STEEL & WIRE COMPANY (AB)
Chicago, Ill. – Cincinnati – Detroit – Milwaukee

CHICAGO STEEL SERVICE COMPANY (AB)
Chicago, Ill.

CLEVELAND TOOL & SUPPLY COMPANY (B)
Cleveland, Ohio

THE CONGDON AND CARPENTER COMPANY (AB)
Providence, R. I. – Fall River, Mass.

C. A. CROSTA, INC. (A)
Denver, Colo.

DUCOMMUN METALS & SUPPLY COMPANY (AB)
Los Angeles, Calif. – Berkeley – Phoenix – San Diego – Seattle

EDGCOMB STEEL & ALUMINUM CORP. (AB)
Hillside, N. J.

EDGCOMB STEEL COMPANY (AB)
Philadelphia, Pa. – Charlotte, N. C. – Greensboro, N. C. – York, Pa.

ESCO CORPORATION (AB)
Portland, Oregon – Denver – Emeryville, Calif. – Eugene, Oregon – Honolulu – Los Angeles – Seattle – Spokane – Vancouver, B. C.

PETER A. FRASSE & COMPANY, INC. (AB)
New York, N. Y. – Buffalo – Hartford – Lyndhurst, N. J. – Philadelphia – Syracuse

FIRTH BROWN STEELS LTD. (AB)
Montreal, P. Q. – Toronto

GATE CITY STEEL, INC. – OMAHA (A)
Omaha, Nebr.

INDUSTRIAL STAINLESS STEELS, INC. (B)
Cambridge, Mass. – Buffalo, N. Y.

EARLE M. JORGENSEN COMPANY (AB)
Los Angeles, Calif. – Dallas – Denver – Honolulu – Houston – Oakland – Phoenix – Seattle – Tulsa – Wichita

MAPES & SPROWL STEEL COMPANY (AB)
Union, N. J.

METAL GOODS CORPORATION (AB)
St. Louis, Mo. – Dallas – Denver – Houston – Memphis – New Orleans – N. Kansas City, Mo. – Tulsa – Wichita

MONCRIEF-LENOIR MFG. COMPANY (AB)
Houston, Texas – Dallas – Harlingen – Lubbock – San Antonio – Temple

MORRISON STEEL COMPANY (AB)
New Brunswick, N. J.

THE ORLEANS STEEL PRODUCTS COMPANY, INC. (A)
New Orleans, La.

WILLIAM M. ORR COMPANY, INC. (AB)
Pittsburgh, Pa.

PAPER-CALMENSON & COMPANY (A)
St. Paul, Minn.

RICHARDS & CONOVER STEEL & SUPPLY COMPANY (A)
Kansas City, Mo.

SEABOARD STEEL & IRON CORP. (B)
Baltimore, Md.

SENECA STEEL SERVICE, INC. (AB)
Buffalo, N. Y.

SOUTHER STEEL & ALUMINUM COMPANY (A)
St. Louis, Mo.

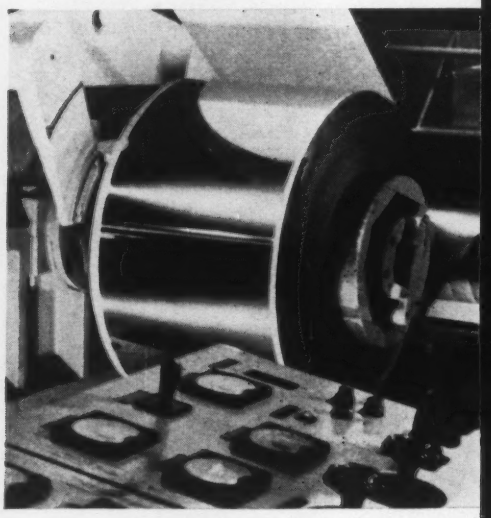
J. M. TULL METAL & SUPPLY CO., INC. (AB)
Atlanta, Ga. – Birmingham – Greenville, S. C. – Jacksonville – Miami – Tampa

VIKING STEEL COMPANY (AB)
Cleveland, Ohio

VORYS BROTHERS, INC. (AB)
Columbus, Ohio

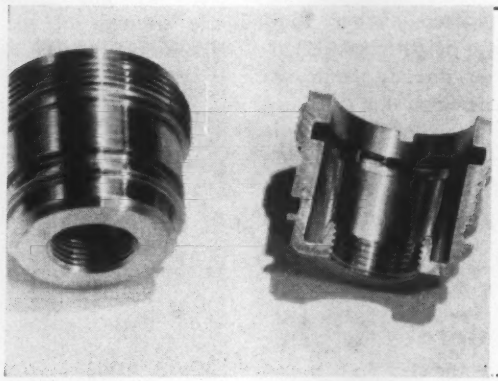
YORK CORRUGATING COMPANY (A)
York, Pa. – Washington, D. C.

You'll find it pays to on special Armco Stainless



Use this label to identify modern, durable stainless steels in your products.

A C



Armco Division, Armco Steel Corporation
2521 Curtis Street, Middletown, Ohio

PLEASE SEND MORE DATA ON

- ☐ Armco Stainless Steels
- ☐ Bright Annealed Stainless Strip
- ☐ Precipitation Hardening Stainless Steels
- ☐ **Controlled Hardness** 410 and 416 Stainless

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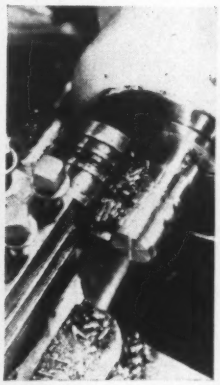
get "up-to-date" Steels



D

B

Bright annealed strip . . . precipitation-hardening stainless . . . close-tolerance sheets . . . controlled hardness bars . . . these are just a few of the special weapons now available in Armco's growing "arsenal" of stainless steels to help *you* fight costs and competition.

Major advantages of these special steels are featured here. Mail the coupon or call your nearest Armco Sales Office or Armco Stainless Steel Distributor for details about these or other Armco Stainless Steels.

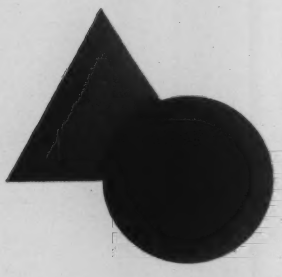
A When your tolerances require eyelash-accuracy, Armco's powerful new 50-inch Sendzimir mill is called into action. With the precision of a fine watch, this ultra-modern mill rolls wide stainless steel sheets and coils to close tolerance specifications.

B Since 1955, Armco has supplied automotive trim fabricators with bright annealed stainless steel strip—the first produced in the industry. This fine, decorative finish is available in 12 Armco Stainless grades in widths to 22 inches.

C Armco Precipitation Hardening Stainless Steels are kicking the props from under costs even when they replace alloy steels. The coupling pictured, for example, formerly was made of SAE 4140 steel. Now it's produced from Armco 17-4 PH Stainless bars, with resulting production economies that add up to a **52% cost reduction.**

D Machining headaches caused by hardness variations in Types 410 and 416 stainless can be quickly cured by ordering these grades from Armco to a "Controlled Hardness" range. By a special process, Armco tightens controls on hardness ranges between Rockwell C26 and C38 to produce consistency of hardness superior to standard hardened and tempered 410 and 416.

ARMCO **Armco Division**



An important source for North American high-speed and specialty steels

ATLAS STEELS

DESIGN DIGEST

Aids Gage Reading

An ingeniously-simple magnifying instrument cuts height-gage reading time up to 60 pct. It's for use on all precision machine tools equipped with a height gage. Readings are made directly from the magnifying lens. You don't need to make any other adjustments. The unit incorporates a precisely-ground optical lens and mirrors to magnify scale numbers 2½ times. (Pan Technics, Inc.)

For more data circle No. 24 on postcard, p. 79

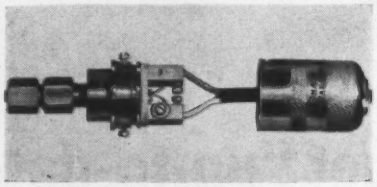
Vinyl-to-Metal

Among the newer and more-versatile materials available to designers and engineers are vinyl-to-metal laminates. These consist of a vinyl-plastic sheeting bonded to a metal surface with a thermosetting adhesive. The sheets bond to steel, aluminum, magnesium or other metals. Advantages are color, design, texture and abrasion resistance, as well as resistance to acids, alcohols, corrosion, heat, electricity and weather. In addition, they form up in the same way as plain metal sheets. Properly made, the new laminates have a bond strength greater than the tensile strength of the vinyl sheets. (Poloron Products, Inc.)

For more data circle No. 25 on postcard, p. 79

Thermocouple Head

Here's a thermocouple head that gives good service at temperatures up to 1500°F. This service limit was obtained by introducing an aluminum-oxide terminal block into



the compact, closed head. Chrome finished for corrosion resistance, this head accommodates 30-14 gage lead wire by simply loosening, but not removing, the thermocouple terminal screws. (Conax Corp.)

For more data circle No. 26 on postcard, p. 79

Adapts Boring Machine

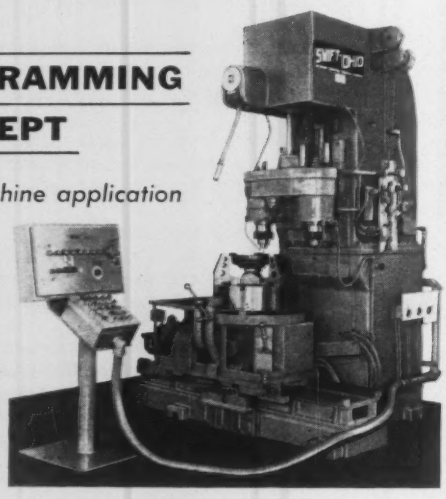
An advanced tracing attachment converts a vertical turning and boring machine into a contour turning lathe. It mounts to the ram or turret of the machine. Or, depending on the individual machine, it may take the place of the side head. No conversion is necessary. When tracing isn't needed, just remove the attachment. You're back where you started; set for conventional turning and boring. But, with the new unit on the job, you're ready to tackle OD, ID and facing operations. To hold the cutting tool, one tool holder comes with the tracing unit. But, other sizes are available as optional equipment. Universal mountings position the tool to the right or to the left. The tracer itself is complete with side assembly, tracer, template rail and hydraulic power unit, with all lines and fittings. Specifications include: 4-in cylinder bore, 9-in. stroke and 9- to 12-oz stylus pressure. (True-Trace Corp.)

For more data circle No. 27 on postcard, p. 79

SWIFT

NEW PROGRAMMING CONCEPT

broadens Swift Ohio machine application



Now do automatic or manual drilling, tapping, counterboring and positioning, using any type of electrical automatic cycling operation. New Swift Ohio positioning "BLOX"© system, plus direct reading scales and adjustable cams, simplifies machine setup — no need for many jigs and fixtures.

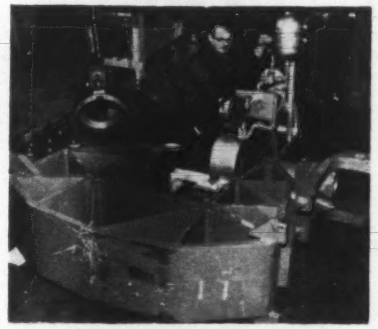
Selective push button controlled rotary Index Table, and multiple spindle drilling machine provide fast, simplified machine setup on any bolt circle of like configuration. The machine's versatility broadens its usefulness to include job shop, maintenance and limited production plant operations.

Write or phone now for data!

SWIFT CORPORATION KENTON, OHIO

MULTIPLE-OPERATION EQUIPMENT FOR WELDING, MACHINING, ASSEMBLY, SPECIAL MACHINERY

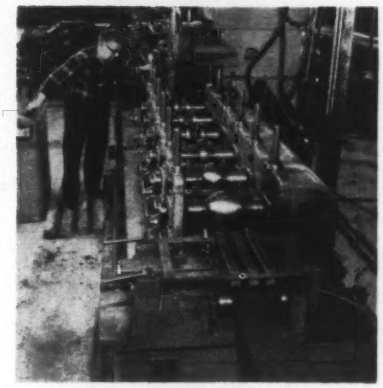
New Equipment and Machinery



Riveter Has Welded Frame and Steel Castings

Big-yoke riveting machines, with working pressures of 30-175 tons, are usually made of heavy-steel castings for necessary strength. Now, engineers have come up with a design for an 80-ton riveter, fabricated from a welded-steel frame and two alloy-steel castings for the nose and head parts. This weldment-casting design takes full advantage of advanced welding methods. It also uses steel castings, with differential heat treatment, where they do the most good. Here's one advantage of using this construction: It does away with the need for large sand-casting patterns. Also nose parts boast extreme hardness. (Hanna Engineering Works)

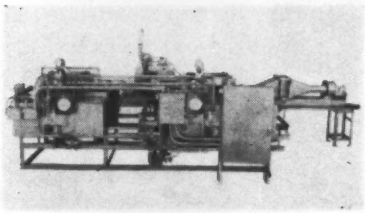
For more data circle No. 28 on postcard, p. 79



Vapor-Cooled Welder Speeds Tube Production

Here's a welding machine that boosts pipe production up to 60 pct. Heart of the new development is a vapor-cooled transformer that ups amperes-to-weld and decreases power-input. Key feature of this unit is a cooling system which uses a non-toxic fluorocarbon instead of recirculated water or oil. Before, fluorocarbons cooled huge power equipment, but never a compact unit. With this method, there's no need for a secondary conductor system. As a result, current travels directly from the transformer to the electrode. This greatly reduces secondary impedance. Now, let's see what the new design means in terms of practical results. As an example, on a prototype model operating under actual working conditions, production rate rose to 50 fpm—a boost of 60.5 pct. (Yoder Co.)

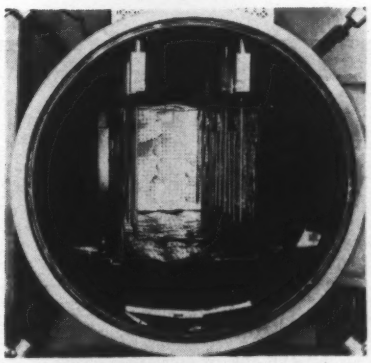
For more data circle No. 29 on postcard, p. 79



Plastic-Coating System Heats, Cures and Cools

A plastic-coating system applies powdered epoxy to a uniform thickness. The equipment deposits this powder into slots in both ends of electric motor armatures, without coating the armature surface or the mounting shaft. Product movement, heating, ventilation and the coating process are all automatic. Gas heats both ovens, while a fan handles recirculation. (W. S. Rockwell Co.)

For more data circle No. 30 on postcard, p. 79



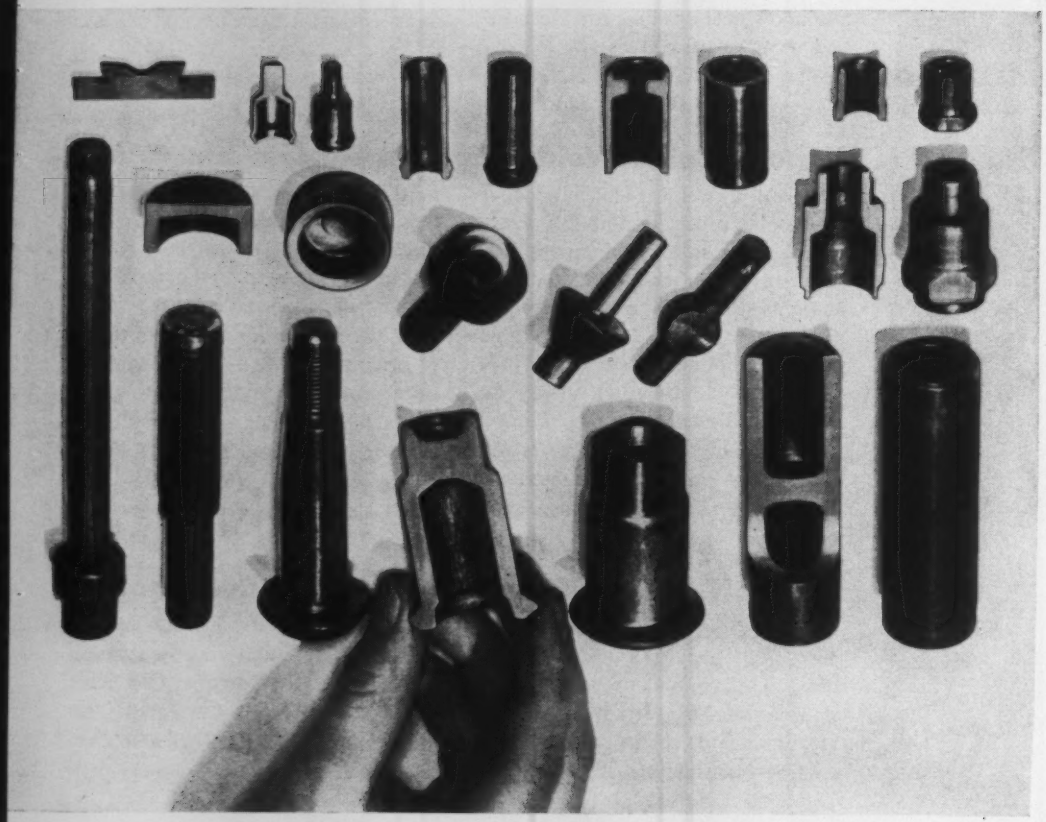
Vacuum Furnaces Suit High-Temperature Research

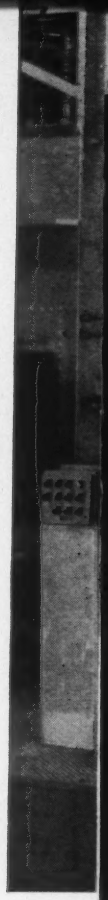
Units in a comprehensive line of hight-temperature, cold-wall vacuum furnaces produce 4500°F at pressures of 1 x 10^{-5} mm of mercury. They suit research and development, as well as production work in the electronics, space and nuclear fields. Nine sizes of 27 models all employ internally-heated hot zones. Sizes range from 60-2700 cu in. The array of hot-zone heating elements consists of a series of refractory-metal rods individually attached to water-cooled connectors. Several layers of thin, refractory-metal sheets make up the surrounding heat shield. These are mutually supporting in an otherwise uncluttered vacuum chamber. No other insulation is used inside the chamber. (Geophysics Corp. of America)

For more data circle No. 31 on postcard, p. 79

From the industry's most advanced bar mill...

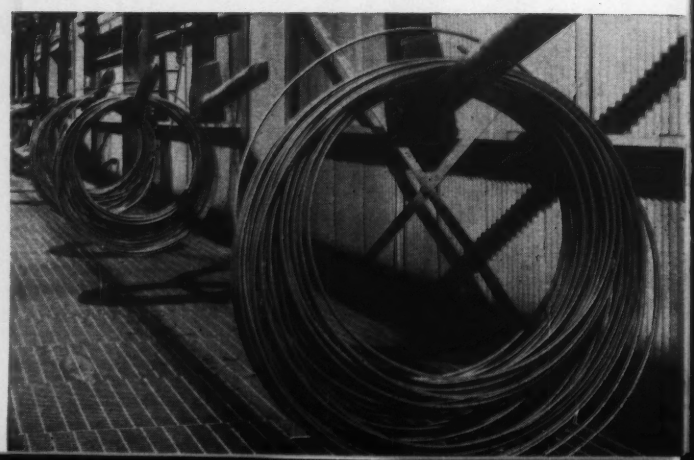
REPUBLIC STEEL FOR COLD EXTRUSION

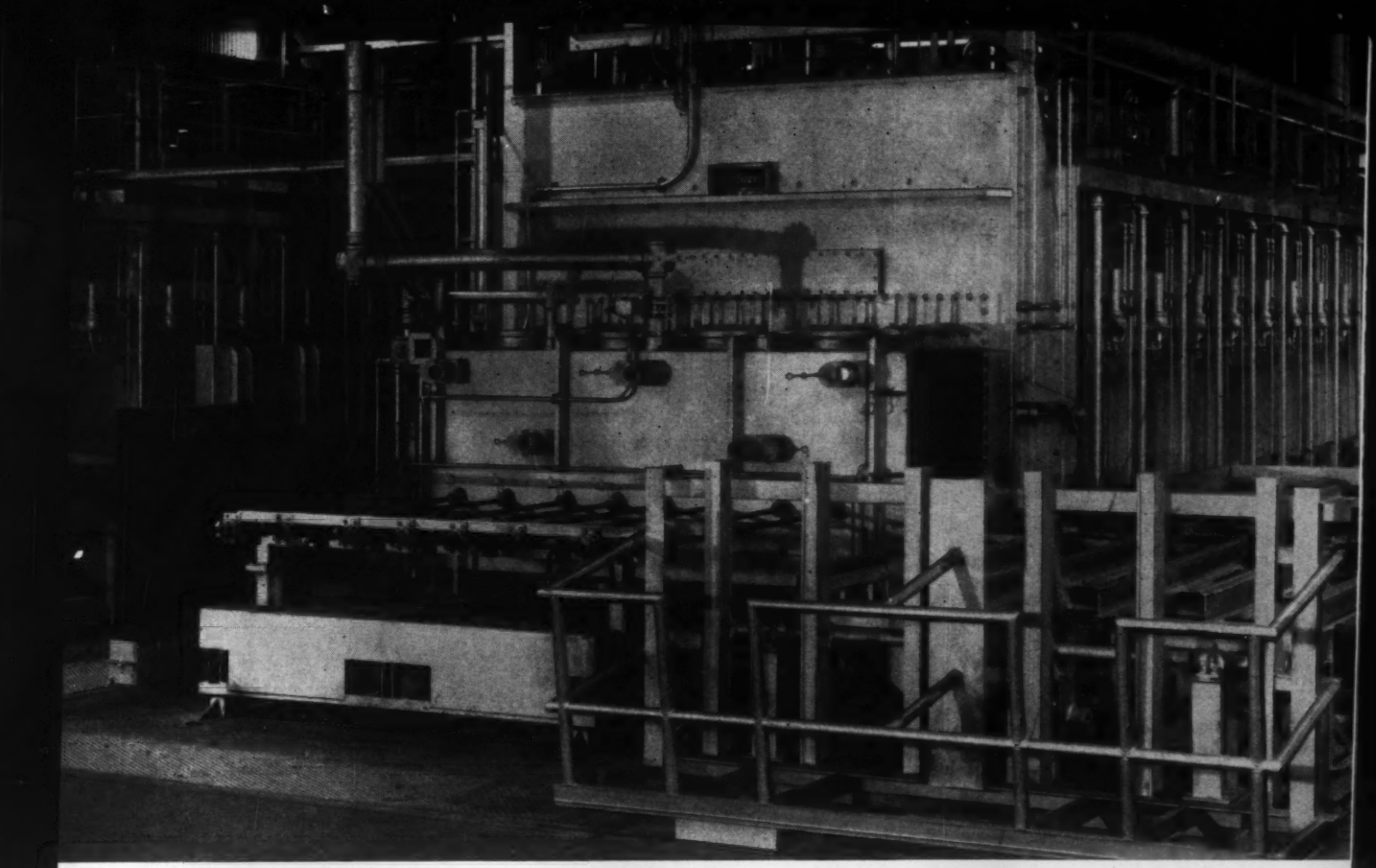




THE COLD EXTRUSION PROCESS virtually eliminates raw material waste. Standard equipment is available so that retooling costs are not excessive. Bars produced on this 11″ mill have denser, more uniform structures because they undergo more hot work. A larger than usual billet—3″ or 4″ square—is rolled to finished products of standard sizes.

HEAVIER COILS weighing up to 1600 pounds mean fewer fabrication changeovers, less scrap loss. High speed coilers handle the complete range of bars produced (⅜″ to $^{29}/_{64}$″—700 to 900 pounds; ⅝″ to 1½″—1400 to 1600 pounds). Each coil undergoes ultra-precise inspection to assure conformance to specifications, then is double banded for safe, efficient handling.





Annealed, normalized, or spheroidized to your precise specifications

Atmosphere controlled, continuous annealing furnaces give Republic's new 11″ bar mill maximum annealing capacity. Steel for cold extrusion or cold heading can be furnace-treated, finished, and delivered to your precise specifications. The mill has facilities to pickle, oil, lime, or phosphate coat.

Depending on the nature of your product, you may find it more advantageous to use steel in the cold finished form. Either way, our metallurgists will help you select and apply the most economical bar product—carbon, alloy, or stainless—capable of meeting your requirements.

Republic Steel is the nation's largest producer of steel for cold extrusion. For complete data, contact your nearest Republic representative or mail the coupon below. Please indicate if you would like a metallurgist to call.

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☐ Steel for cold forging ☐ Have a metallurgist call

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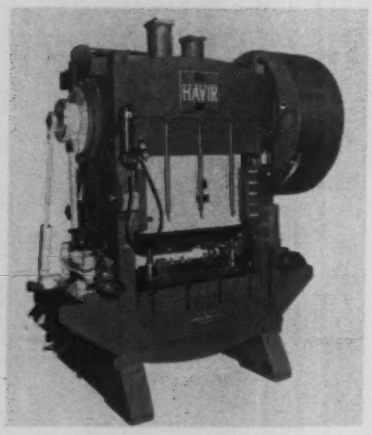
Company_____

Address_____

City_____ Zone____ State_____

Heavy-Duty Press

Longer press and die life are features of a new 150-ton press. This high-speed automatic machine



boasts an exclusive cylindrical ram that lines up the die. Its large guiding surface insures proper mating of the ram, punch and die. Also guarding the dies is an automatic shutoff. If a die jams or misfeeds, the press stops. Another outstanding feature is built-in shock mounts. They allow press operation on any concrete floor. You don't need special floating blocks or shock pits. (Havir Mfg. Co.)

For more data circle No. 32 on postcard, p. 79

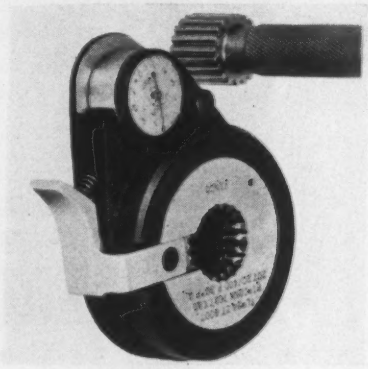
Friction Welder

An efficient new machine welds by friction. Basically, it's a simple process. Friction converts the mechanical energy of two contacting, rotating objects into thermal energy. In practical terms, the technique consists of holding one object fast, while the other rotates and presses against the first. After a specified period of time, the rotation stops. Then, pressure increases. This condition is held for another specified period. Despite this simplicity, friction welding handles a vast range of materials, even ceramics and plastics. In many cases, it eliminates the need for fluxes and special gaseous atmospheres. (American Machine & Foundry Co.)

For more data circle No. 33 on postcard, p. 79

Gages Tooth Thickness

Fast accurate measurements of "effective" tooth thickness or space width of involute splines are a function of a new gage. The newcomers are unconditionally guaranteed for one year. They're designed to elim-



inate human error. Both ring- and plug-type units are available in portable and bench models. They can be made to check any type of spline in sizes from 0.18-in. pitch diam and up. (Vinco Div., Vinco Corp.)

For more data circle No. 34 on postcard, p. 79

CONTROL

New! Versatile Cutler-Hammer oiltight pushbuttons let you make any station you want

The new interchangeability built into these operators lets you create the station you want from a complete selection of Cutler-Hammer pushbuttons. Get them in one hole or base mounting, 6 bright colors. Thirty different circuit arrangements can be made in hundreds of varieties of stations in standard arrangements of up to 25 elements. Get up to 8 circuits on one pushbutton. They take 40% less back-panel space than next smallest unit so you get more control in less space Get facts in PUB. LO-104-L246.

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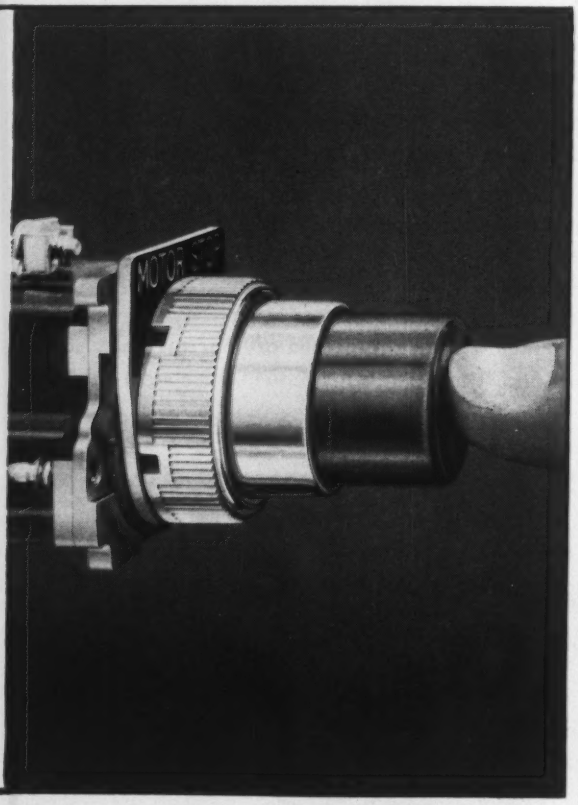

July Slump; Then a Comeback

The seasonal July slump is likely to be followed by a pretty good comeback in orders and production.

But all bets for September are off unless auto negotiations are settled without a strike.

■ Steelmaking operations are expected to bounce back strongly from the July seasonal letup. Just as the July slump now looks to be less severe than was expected.

This is based on indications from Detroit of strong orders for August delivery and general orders that have put July in a stronger position than seemed likely a week ago.

Auto Labor?—The August upturn is expected to continue on through September, assuming automakers and the United Auto Workers settle their contract negotiations without a strike or work disruption. September orders for steel by automakers will be affected by negotiations as the Aug. 31 deadline approaches.

Although auto steel orders are the strongest single factor in the summer steel trend, there are other elements involved.

Tubular products should remain at least as strong through summer months and continue the gradual rise that began six months ago. Major oil producers advise they will be back in the market soon. Oil well activity is now running ahead of last year.

Other Elements—Although tinplate shipments continue to lag, this is more a problem of tight inventory control rather than any weakening of basic demand. Can shipments are running ahead of last year although steel companies are bearing an added cost of holding large tinplate inventories.

Regional factors are also important in the steel demand picture. The Midwest and West are feeling a much stronger general demand than other areas.

In the important automotive sector, orders for July delivery are down from June, but still much better than the monthly average for the first quarter. Much of the July tonnage is on a rush basis, as automakers round out their final 1961 model runs.

By Comparison—August is running ahead of both May and June at comparable advance dates for almost all sheet products except hot-rolled. Several auto companies have placed good orders for the first two weeks of August. The real automotive pickup will not come until September, or whenever auto labor contracts are signed.

In spite of the good automotive orders, full-scale production is not likely until labor contracts are signed. Automakers do not want to get caught with stocks of new cars that have not yet been shown to the public.

Earnings Up—As the end of the second quarter approaches, it's apparent that earnings of steel companies will show a big improvement over the first quarter. For some companies, earnings will be relatively high, considering the moderate rate of steelmaking operations.

The steel price situation is unchanged, with price and extra shadings continuing for many products. A break in major tonnage products now seems less likely, however. Automakers, who would be the leaders, now seem less interested in breaking the price front. Instead, they are insisting on high quality, prompt delivery, and other services that will help lower auto production costs without breaking prices.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	101	102	108	101
Buffalo	84	108	118	89
Pittsburgh	93	95	93	87
Youngstown	89	100	98	79
Cleveland	123	126	123	108
Detroit	134	138	134	116
Chicago	114	115	113	95
Cincinnati	118	122	116	77
St. Louis	120	119	122	86
Southern	117	111	104	93
Western	122	124	128	97
U. S. Index	106.2	109.6	109.3	93.3

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,978	1,985	43,146	58,876
Ingot Index				
(1957-59=100)	106.2	106.6	92.6	126.4
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$37.17	$37.83	$36.83	$31.00
No. 2 bundles	$24.17	$24.83	$24.17	$20.83

Selection Cuts Diamond Cost

Industrial diamonds' performance can be improved. And the cost can be cut. At least one company has proven this is true.

Englehard Hanovia, Inc. developed segregated diamonds.

■ Industrial diamonds are invaluable to industry for cutting and grinding. But they are still just super-hard chunks of carbon — a product of nature. As such, can their performance be improved?

"Yes," says John H. Olson, manager of technical services for the industrial diamond div., Englehard Hanovia, Inc., Newark, N. J. Englehard is the nation's largest distributor of industrial diamonds.

Mr. Olson says industrial diamonds can be tailored to a specific use. They're not bought in large chunks, he explains, but usually come in the form of powder, or grit for cementing onto cutting wheels and edges.

Shape Count — Engelhard has come up with a shape count method to do just that. Basically, Mr. Olson reports, the company starts by assigning values to the different shapes of diamond particles based on their cutting potential. For instance, flat platelets, with the most cutting edge, are rated "4." Needle-like particles, that keep breaking and exposing a new cutting edge, are rated "3." Rectangular shapes rate "2"; cubes rate "1."

In each batch of grit, 100 diamond particles are counted and rated under an electron microscope. The batch is assigned the average.

For resin-bonded diamond wheels, used in carbide cutting, Mr. Olson recommends an average of 3.1 or better.

Other Ratings—For metal-bonded diamond wheels, usually used in heavier and slower applications, a rating of 2.1 to 2.4 is superior.

This method is called SND—selected natural diamonds—by the company. There is no premium for this over unsegregated lots.

Mr. Olson claims SND resin-bonded diamond wheels are 40 pct better than wheels with unsegregated diamonds. He says they are freer and easier cutting.

For metal-bonded SND he offers this example of possible economy: "A blade manufacturer contracted to saw concrete with a diamond blade at 10¢ per ft. He found that conventional diamond blades were running his costs to 20¢ per ft. He switched to SND wheels and reduced costs to 7¢."

Other Uses — Mr. Olson also notes that Engelhard has extensive research projects underway looking for new uses for industrial diamonds. EH is not experimenting with bonding diamonds to wheels and edges. The company only sells the diamonds and prefers to leave bonding research to the toolmakers.

But, he says, the company has and will cooperate with diamond wheelmakers to improve bonding materials and techniques.

The diamond delivery situation is "excellent." Engelhard maintains a minimum supply on hand at all times of at least 90 days. Mr. Olson says the company can ship the day after an order is received.

Price Range — Prices are also holding steady with a range of $2.80 to $2.90 per carat, depending on the range and size of material.

How does a company select the proper diamond concentration (72 carats per cu in. rates 100) for its particular job?

"Every job is different, so I can't give you a rule of thumb. But we're very glad to work with diamond wheelmakers and their customers on the specific problems."

OLSON: Diamond performance can be improved.

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Delivery Promises Show Little Change

With one exception, delivery promises from mills remain unchanged from last month.

But an easing in the Chicago area, just brings these delivery promises in line with other sections.

■ With one exception, mill delivery promises are virtually unchanged from a month ago. The exception is the Chicago district where delivery estimates shortened. However, the changes only bring that area's promises in line with other districts.

For the most part, Chicago delivery promises shortened one week on the low side and two weeks on the high side. They are back to the April level.

Over the past two months many mills have started up additional blast furnaces and openhearths as the level of business moved upward. Thus, they have been able to maintain the quick deliveries demanded by steel users.

Now, with plant vacations and other seasonal factors taking effect, the pressure on mills is easing. However, it is because there are sufficient facilities operating to meet demand. It is not due to any significant change in buying practices of customers. They're still waiting untill the last minute before placing orders, then playing one mill against the other for the quickest delivery.

Generally, few products require more than a month between the time an order is placed and delivery can be expected. However, galvanized continues very tight. In some cases, mill schedules are filled for the next two months. And on the West Coast heavy plate tightened a little, moving from five weeks to six weeks.

Sheet and Strip—Orders for cold-rolled sheet point to a drop in shipments in July. However, automakers are still coming in with rush orders for spot tonnages, according to reports from **Detroit.** As the auto industry nears the end of the current model run, plant inventories have to be balanced. **Chicago** mills report a similar situation.

August is running ahead of both May and June at comparable advance dates for practically all sheet products except hot-rolled. A **Pittsburgh** mill is predicting a sharp upturn in August. But auto labor negotiations could knock all predictions for a loop. A serious breakdown in contract talks could upset auto buying plans and bring deferments.

Plates and Structurals — Heavy steels are expected to share in the July decline. One exception may be plates. Advance orders and word of linepipe activity indicate June levels may be maintained. There are reports from **Pittsburgh** that prices of heavy steels have shown signs of weakening. Minor price cutting is in progress around the fringe of the industry, but there has been no big break.

A report from **Chicago** says that new freight car orders won't show much life until at least the fourth quarter of 1961. One source says the third quarter will show 6000 new orders; it will go up to 10,000 in the fourth quarter of 1961. But the first half of 1962 should bring orders for 13,500 new freight cars in each of the two quarters, the source says.

Pipe and Tubing — Producers hope to escape the July lag and even show improvement. Reason for the optimism: **Pittsburgh** producers point out tubular products are tied more to the seasonal cycle of construction than to general industrial activity.

After a slow start, oil well activity is now running ahead of last year. This could bring major oil producers back into the market.

Export—U. S. Steel Corp. has withdrawn published export prices for semi-finished steel. The company says the move was made because no steel could be sold at the published price.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	3–5 wks	3–5 wks	2–4 wks	3–6 wks	3–4 wks	5–6 wks
HR Carbon Sheet	2–5 wks	3–4 wks	1–3 wks	2–5 wks	2–3 wks	5–6 wks
CR Carbon Strip	3–5 wks	4–5 wks	2–4 wks	3–6 wks	3–4 wks	4 wks
HR Carbon Strip	2–5 wks	3–4 wks	1–3 wks	2–5 wks	2–3 wks	5 wks
HR Carbon Bars	2–4 wks	2–3 wks	1–4 wks	1–5 wks	1–3 wks	4 wks
CF Carbon Bars	2–4 wks	2–3 wks	Stock–4 wks	Stock–5 wks	2–3 wks	1–2 wks
Heavy Plate	2–3 wks	2–3 wks			1–2 wks	6 wks
Light Plate	2–3 wks	1–2 wks	1–3 wks		1–2 wks	5 wks
Merchant Wire	Stock	Stock	Stock		3–4 wks	2 wks
Oil Country Goods	Stock	Stock	Stock		Stock–2 wks	
Linepipe	Stock	1–4 wks	Stock		1–3 wks	Stock
Buttweld Pipe	Stock	Stock	Stock	Stock	1–2 wks	Stock
Structurals	2–4 wks	1–2 wks	1–4 wks	1–4 wks	2–4 wks	Stock–4 wks
CR Stainless Sheet	Stock–4 wks	Stock–3 wks	Stock–3 wks	Stock–4 wks		
CR Stainless Strip	Stock–4 wks	Stock–3 wks	Stock–3 wks	Stock–4 wks		

COMPARISON OF PRICES

(Effective June 26, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

* Price changes from previous week are shown by an asterisk (*).

	June 27 1961	June 20 1961	May 29 1961	June 28 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.60
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes.	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	June 27 1961	June 20 1961	May 29 1961	June 28 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti.	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. cents per lb.‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$36.50	$36.50	$34.50	$30.50
No. 1 steel, Phila. area	38.50*	39.50	39.50	33.50
No. 1 steel, Chicago	36.50*	37.50	35.50	29.00
No. 1 bundles, Detroit	35.50	35.50	34.50	27.50
Low phos. Youngstown	40.50	40.50	40.50	33.50
No. 1 mach'y cast, Pittsburgh	45.50	45.50	45.50	49.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	51.50
No. 1 mach'y cast, Chicago	48.50*	49.50	47.50	45.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$37.17*	$37.83	$36.83	$31.00
No. 2 bundles	24.17*	24.83	24.17	20.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.00	31.00	31.00	33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	119.50†	113.125**	111.125	101.75
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strip.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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*Appears in the June 22-July 6 issues.

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Market Uncertain; Prices Waver

Scrap prices in Chicago dropped $1 to $2 this week. Other areas report prices are wavering and might fall.

Exporters have less interest just now and domestic mills are vacation-minded.

■ The undertone of strength that had been prevalent in the scrap market during recent weeks has given way to weakness.

Reason: Sudden withdrawal of export interest in the face of domestic vacation schedules. Because of this situation, strength may not come back to the market until mid-July.

The most distinct sign of weakness appears in Chicago this week. Prices there dropped $1 to $2 as exporters pulled out of the market. Prices in other areas, especially Pittsburgh, Detroit, New York, and Philadelphia, are wavering. Industrial lists will play a major role in the market in several key areas.

The only market still reporting optimism among scrapmen is Cincinnati. Industrial lists could set the tone for a firmer market there.

Even with the disappearance of the recent strength, the scrap market is still considerably stronger than a year ago at this time. The IRON AGE composite price for No. 1 heavy melting in June, 1960 was $31.25. The composite price for June this year is $37.67. And the chances are good that this price won't collapse in the next few weeks.

Pittsburgh—Prices wavered uncertainly this week as scrapmen waited for industrial lists to indicate the mood of brokers and mills. The local automotive tonnage for July is down nearly 50 pct from June. The lightness of offerings is working against a sharp price drop. However, consumption of scrap is also expected to fall in July. Indicating reduced requirements, one mill is testing a price of $23 for No. 2 bundles.

Chicago—Prices sagged $1 to $2 as export support was temporarily withdrawn from this market. The move enabled local mills to buy fair quantities at reduced prices. Nearly all grades were affected. Factory bundles, with major lists still unopened, remain in doubt since tonnages offered will be small. There is speculation that factory bundle prices will dip slightly but show greater strength than the rest of the list.

Philadelphia — The market has definitely lost some of its firmness. But area scrapmen say this is largely due to the oncoming vacation schedules. Biggest items now are No. 1 bundles and No. 1 busheling which are moving at quoted prices. The export market weakened some more this week.

New York—"This market is not very peppy," says one dealer. Another says it is "flattening out." Both agree with the consensus, that prices are still holding at current levels.

Detroit—July industrial lists close this week. The direction prices will go is a question mark. Generally, primary grades are expected to hold steady while secondary grades will ease slightly. But any move is likely to be small. Tonnage is about 50 pct below June. Local mills are operating well.

Cleveland — Prices hold steady as the time for industrial lists approaches. Brokers expect the market to maintain current levels. They point out that auto tonnage is down 40 to 50 pct. They say attempts to buy at reduced prices on old orders meet little success.

Cincinnati—Scrapmen are looking for industrial lists to set the tone for a strong summer market. This optimism won't be confirmed until prices are known. Some scrapmen feel weakness is possible. However, the general feeling is that lists will show firmness or new strength and that this will be followed by mill purchases at higher prices.

St. Louis—Scrap demand is slow as export pressure continues to ease. However, prices are unchanged and are expected to remain firm for a few more weeks. Most scrapmen look for demand for auto steel and improvement in the export picture to bring an upturn soon.

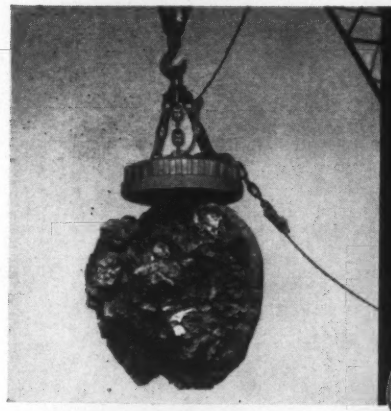
Birmingham — The market is about the same as last week with only limited buying. Brokers say consumers claim some prices are too high. Dealers insist they are not high enough.

Buffalo—Situation is unchanged. There are indications of sloppiness in the market. Mills appear to have enough scrap on hand to carry them well into July.

Boston — The market is even slower than last week. Export deman is off and domestic interest is practically nil.

West Coast—The domestic market is quiet. Dealers are waiting to see whether the mills will do any substantial July buying. Prices are firm. Export is still active.

Houston — The market shows signs of weakness and brokers anticipate lower prices. Mill operations will be slowing down. A pipe mill will be shutting down for summer vacations.



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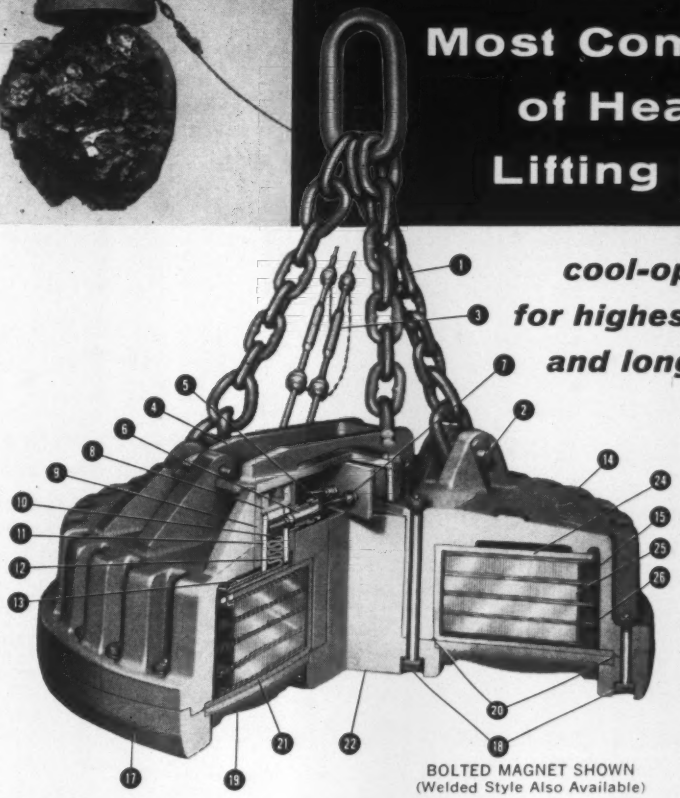

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Stearns lifting magnet designs are based on job requirements determined from a continuing 30-year program of field research — a combination of our experience and yours with the features *you* asked for.

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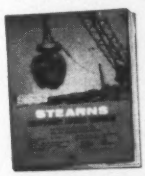

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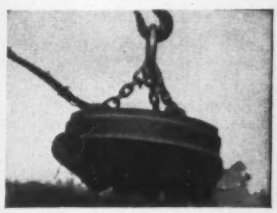
designed specifically for Scrap Handling. These lightweight, low-cost, aluminum-wound units provide unequaled value-performance with no sacrifice in capacity or construction quality. Ask for Bulletin 3022W.



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1. Heavy-duty alloy steel chain
2. Long-wearing alloy steel link pins
3. Quick-disconnect plug and receptacle with safety chain link
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5. Watertight, squeeze-type, grommet lead wire fittings
6. Steel mill duty, male connector for easy maintenance
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8. Dryseal pipe plugs for positive sealing of lead wire cavity
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14. Heavily ribbed, high-permeability, one-piece, continuous-cast magnet body
15. Non-remeltable, high-temperature filling compound
16. Hydrogen-free, continuous, automatic-machine weld (welded magnet only)
17. Cast, wear-resistant outer pole shoe
18. High tensile, square head, alloy steel bolts
19. Manganese steel bottom plate — ribbed for added strength and wear qualities
20. Continuous internal welds lock coil in place and provide completely watertight construction
21. Heavy non-magnetic coil cover for protection against external shocks
22. Center pole of wear-resistant, high-permeability steel
23. Center pole top-weld provides shock-absorbing strength (welded magnet only)
24. All-welded coil bobbin
25. Heavy copper-strap coils with long-life Quinterra tape insulation
26. High-temperature, high mechanical strength, asbestos base pancake insulation

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CORPORATION

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Profit with Stearns — First with Ceramic Magnet Separators for Industry

SCRAP PRICES *(Effective June 26, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs plate	41.00 to 42.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	46.00 to 47.00
Rails, 2 ft and under	50.00 to 51.00
RR specialties	43.00 to 44.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	100.00 to 110.00
430 bundles and solids	80.00 to 85.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	44.00 to 45.00
Low phos. punch'gs plate, ¼ in. and heavier	44.00 to 45.00
Low phos. 2 ft and under	41.00 to 42.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	58.00 to 60.00
Rails 2 ft and under	49.00 to 50.00
Angles and splice bars	44.00 to 45.00
RR steel car axles	58.00 to 59.00
RR couplers and knuckles	43.00 to 44.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	42.00 to 43.00
Cast iron wheels	34.00 to 35.00
Malleable	46.00 to 47.00
Stove plate	36.00 to 38.00
Steel car wheels	42.00 to 43.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	105.00 to 110.00
430 bundles and solids	90.00 to 95.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	26.00 to 27.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft punch'gs	44.00 to 45.00
Elec. furnace bundles	43.00 to 44.00
Heavy turnings	27.00 to 28.00
RR specialties	42.00 to 43.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	40.50 to 41.50
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	39.00 to 40.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	34.00 to 35.00
Heavy breakable cast.	31.00 to 32.00
Drop broken cast.	45.00 to 46.00

Youngstown

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Low phos. plate	40.00 to 41.00

Cleveland

No. 1 hvy. melting	$34.50 to $35.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	34.50 to 35.50
No. 1 factory bundles	38.50 to 39.50
No. 2 bundles	22.50 to 23.50
No. 1 busheling	34.50 to 35.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	39.50 to 40.50
Low pros. punch'gs plate	35.50 to 36.50
Drop forge flashings	34.50 to 35.50
Foundry steel, 2 ft & under	34.00 to 35.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	49.00 to 50.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	39.00 to 40.00
Malleable	51.00 to 52.00
Stainless	
18-8 bundles	170.00 to 175.00
18-8 turnings	100.00 to 105.00
430 bundles	70.00 to 75.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth.	38.00 to 39.00
Rails 2 ft and under	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft	31.00 to 32.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	14.50 to 15.50
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. melting	37.00 to 38.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	44.00 to 45.00
RR specialties	40.00 to 41.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	55.00 to 56.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	43.50 to 44.50
Structural and plate, 2 ft	42.50 to 43.50
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rail, random lgth.	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Machine shop turnings	5.00 to 6.00
Mixed bor. and turn.	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	32.00 to 33.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	31.00 to 32.00
Automotive cast.	40.00 to 41.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	4.00 to 4.50
Shoveling turnings	8.50 to 9.00
Clean cast. Chem. borings	14.50 to 15.50
No. 1 machinery cast.	39.00 to 40.00
Mixed cupola cast.	31.50 to 32.00
Heavy breakable cast.	28.00 to 28.50

San Francisco

No. 1 hvy. melting	$41.00 to $43.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	.... 17.00
Cast iron borings	.... 17.00
No. 1 cupola cast.	45.00 to 46.00

Los Angeles

No. 1 hvy. melting	$40.00 to $42.00
No. 2 hvy. melting	37.00 to 39.00
No. 1 dealer bundles	.... 29.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	.... 15.00
Shoveling turnings	.... 15.00
Cast iron borings	.... 15.00
Elec. furnace 1 ft and under (foundry)	.... 50.00
No. 1 cupola cast.	.... 46.00

Seattle

No. 1 hvy. melting	$42.00 to $44.00
No. 2 hvy. melting	38.00 to 40.00
No. 2 bundles	25.00 to 27.00
No. 1 cupola cast.	.... 36.00
Mixed yard cast.	.... 31.00

Hamilton, Ont.

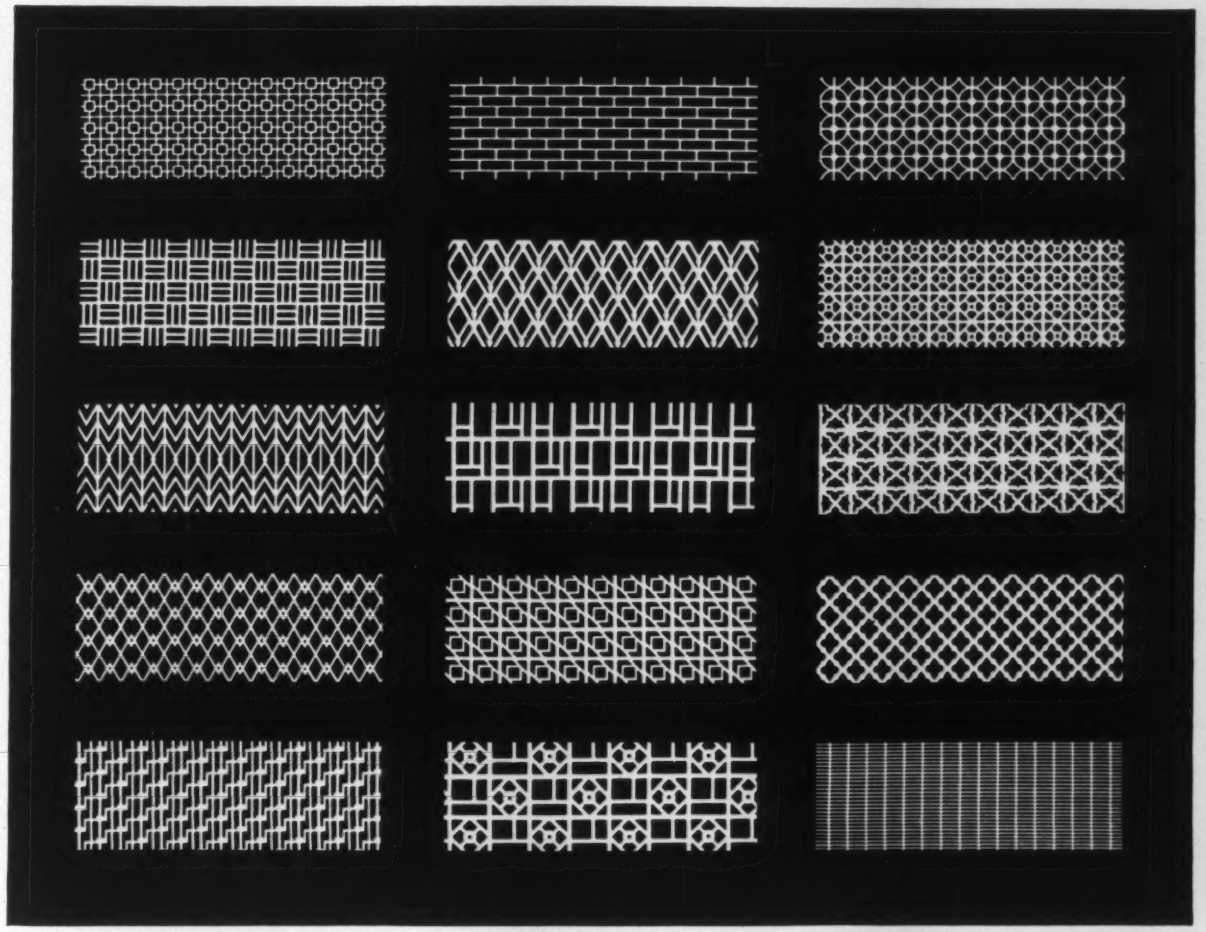
Brokers buying prices per net ton on cars:

No. 1 hvy. melting	.... $31.00
No. 2 hvy. melting cut 3 ft and under	.... 28.00
No. 1 dealer bundles	.... 31.00
No. 2 bundles	.... 21.00
Mixed steel scrap	.... 23.00
Bush., new fact., prep'd	.... 31.00
Bush., new fact., unprep'd	.... 25.00
Machine shop turn.	.... 8.00
Short steel turn.	.... 12.00
Mixed bor. and turn.	.... 12.00
Cast scrap	.... 32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	.... $35.00
No. 2 hvy. melting	.... 31.00
No. 2 bundles	.... 24.00
Machine shop turn.	.... 8.00
Shoveling turnings	.... 11.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	29.00 to 30.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	29.00 to 30.00



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For well over 80 years the metalworking industry has relied on Hendrick for its perforated metal requirements. And with good reason! Hendrick perforated metal combines decorative beauty with the functional strength so often called for on new product specifications. Hendrick's vast stock of dies includes over 100 unusual patterns that are exclusive and only obtainable from the Hendrick Manufacturing Company.

Hendrick perforated plate is available in every type of commercially rolled metal in gauges and sizes of perforations to meet your exact specifications. For more information call your nearby Hendrick sales office. It's listed in your classified telephone directory under Metals, Perforated. Or—for FREE booklet, mail the coupon, today.

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Perforated Metal • Perforated Metal Screens • Wedge Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles
Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Soaring Tin Price: What's Behind It?

The price of tin soared to $1.20 per lb last week, highest since the Korean War.

Adding to the confused market and apparent shortage are speculators, who will have to put the metal back eventually.

■ Late last week the price of tin in New York hit $1.20 per lb—near the Korean War peak.

The same day, a purchasing director for a major steel company told The IRON AGE that his company had very good stocks of tin. It could, if necessary, stay almost completely off the market for over a year.

This paradox points up the confused state of the market.

Artificial Lack — Is there a tin shortage? Yes. But to some extent it's an artificial shortage. Many buyers are speculators and eventually they will have to put the metal back on the market.

Not all tinplate producers are in the same strong position. One reports "comfortable" tin stocks. Several consider the situation serious and are worried.

But these mills also have large stocks of finished tinplate. Much of this is committed but not called for yet.

Can Season — Canmakers traditionally order their tinplate well in advance, then hold up shipments until the canning season. The canning season is here. And canmakers are holding back longer than usual.

The buffer stock of the International Tin Council (tin bought during market surplus, sold during short supply) ran out early last week.

This came as a surprise to most tin traders and buyers in the U. S. One trader says this must mean that the buffer stock placed 8000 tons of metal on the market in little more than 14 days in a futile attempt to stem the rising price.

Comeback Seen — A buyer guesses that the major percentage of this metal was bought by speculators, and will eventually come back on the market.

With prices zooming and speculators unusually active, eventual control of the situation is built-in, say several traders and buyers.

"When the tin price hits a level that is attractive enough, the tin starts coming out of the woodwork," says an experienced trader.

And when speculators figure the price has reached its peak, they will start selling.

World Supply—For 1961, world supply of tin is likely to trail demand by 10,000 to 20,000 tons. And the leveling off may not happen soon, maybe not even this year.

The U. S. has huge supplies of tin. It is estimated that the strategic stockpile contains a full two-year world output.

But it requires Congressional approval to sell.

Special Stock—There is a special tin inventory of 3933 tons which requires no Executive or Congressional approval to sell. This could legally be sold quickly. And the steel industry is bidding for it.

But Washington sources say the State Dept. is recommending very strongly against any sale of government tin. They say it would hurt our Latin America relations.

Molybdenum

In the face of steel price weakness molybdenum prices were boosted by about 10 pct earlier this month by American Metal Climax Corp.

The company cited rising costs as the prime reason. A spokesman said the company had just been hit with wage hikes, had a costly expansion program, and was paying more for all goods and services.

Strong Market — Underlying the increase, however, is the fact that the market was definitely strong enough to take higher prices. An important factor: For the first time in history, molybdenum shipments to Europe exceed shipments to domestic users.

This boom has more than made up for weaknesses in the U. S. steel industry. And with steel operating rates showing promise now in the U. S., sales are apparently shaping up well for the rest of the year.

Tin Prices for the Week

June 20—117.00; June 21—116.75; June 22—117.75; June 23—120.00; June 26—119.50*.

* Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. **Other primary prices, pg. 99.**

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.8
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size*	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.46
Brass, Low	52.15	52.44	52.09	56.21
Brass, Red	53.17	53.46	53.11	57.33
Brass, Naval	53.94	60.25	47.75	58.10
Muntz Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod 34.77

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb) .. $1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. .... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury dollars per 76-lb flask f.o.b. New York ..... $197 to $200
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz.. $24 to $26
Platinum, dollars per troy oz. .$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 420 ..... 30.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 23.75-24.25
- 0.60 copper max. 23.50-24.00

Piston alloys (No. 132 type)..25.00-26.00
No. 12 alum. (No. 2 grade) ...21.75-22.25
108 alloy 22.25-22.75
195 alloy 24.75-25.75
13 alloy (0.60 copper max.)...23.50-24.00
AXS-679 (1 pct zinc) 22.00-23.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 23.25-24.25
- Grade 2—92-95% 22.00-23.00
- Grade 3—90-92% 21.00-22.00
- Grade 4—85-90% 20.00-21.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26¼
Yellow brass	20⅝	18½
Red brass	23⅞	23⅛
Comm. bronze	24⅝	24
Mang. bronze	19¼	18½
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27¾—28¼
No. 2 copper wire	25¾—26¼
Light copper	23½—24
*Refining brass	24½—25
Copper bearing material	23½—24

*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27¾—28¼
No. 2 copper wire	25¾—26¼
Light copper	23½—24
No. 1 composition	23
No. 1 comp. turnings	22½
Hvy yellow brass solids	18½
Brass pipe	17
Radiators	19
Aluminum	
Mixed old cast.	12½—13
Mixed new clips	14½—15
Mixed turnings, dry	13½—14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	24¼—24¾
No. 2 copper wire	22¼—22¾
Light copper	19¾—20¼
Auto radiators (unsweated)	16 —16½
No. 1 composition	20½—21
No. 1 composition turnings	20 —20½
Cocks and faucets	16½—17
Clean heavy yellow brass	14¼—14¾
Brass pipe	16½—17
New soft brass clippings	18 —18½
No. 1 brass rod turnings	16½—17

Aluminum

Alum. pistons and struts	7 — 7½
Aluminum crankcase	9½—10
1100 (2s) aluminum clippings	12¼—12¾
Old sheet and utensils	9½—10
Borings and turnings	4½— 5
Industrial castings	10 —10½
2020 (24s) clippings	11 —11½

Zinc

New zinc clippings	5 — 5¼
Old zinc	3 — 3¼
Zinc routings	1¾— 2
Old die cast scrap	1¾— 2

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	23-23.50
Clean Monel turnings	16.50-17
Old sheet Monel	22-23
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead

Soft scrap lead	7¼— 7¾
Battery plates (dry)	3 — 3¼
Batteries, acid free	2 — 2¼

Miscellaneous

Block tin	85 —87
No. 1 pewter	64 —65
Auto babbitt	46 —47
Mixed common babbitt	10 —10½
Solder joints	15 —15½
Small foundry type	9 — 9½
Monotype	9¼— 9⅝
Lino. and stereotype	8½— 8⅝
Electrotype	8 — 8¼
Hand picked type shells	5⅝— 6¼
Lino and stereo. dross	1¾— 2¼
Electro dross	2½— 3

(Effective June 26, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective June 26, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes^ *1.25*-lb. base box	Electro^^ *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ^ COKES: 1.50-lb. add 25¢. ^^ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*			Hollowware Enameling 29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.		
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

^ Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢. †† 7.425 at Sharon; Niles is 7.225.

(Effective June 26, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr'a. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries. (See page 174.)		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*		7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher.

* Special Quality.

(Effective June 26, 1961)

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery; Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	7.87	9.71	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	16.76	16.65	.....	.....
Boston**	.10	10.00	10.50	11.87	12.50	9.95	10.60	10.15	13.45	17.79	16.69	21.89	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.69	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	7.91	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.20	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.13	10.50	10.95	11.44	9.47	9.82	8.97	12.89	.....	.....	.....	.....
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.24	20.49
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.90	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		9.45	11.30	12.35	12.40	10.55	11.00	9.45	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.95	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	18.00	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round. cold drawn—15/16" to 2⅞" round.

†† 13c zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier: [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective June 26, 1961)

PIG ITRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)

	Pct
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)

	Pct
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

	Pct
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*, Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*; Reading, Pa., *C2*; Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Ambridge Pa., *B7*; Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective June 26, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	....	212	193	9.00	9.55
Aliquippa *J3***	173	190	....	....	190	9.00	9.675
Atlanta *A8***	173	191	....	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	....	214	198	9.10	9.80
Donora Pa. *A5*	173	187	....	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	....	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2**	178	192	....	217	198	9.25	9.80†
Jacksonville *M4*	175	192	....	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	....	196	9.00	9.675
Joliet Ill. *A5*	173	187	....	212	193	9.00	9.55
Kokomo *C9**	175	189	....	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**.	178	192	....	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
Sparrows Pt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $280 per net ton.

	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

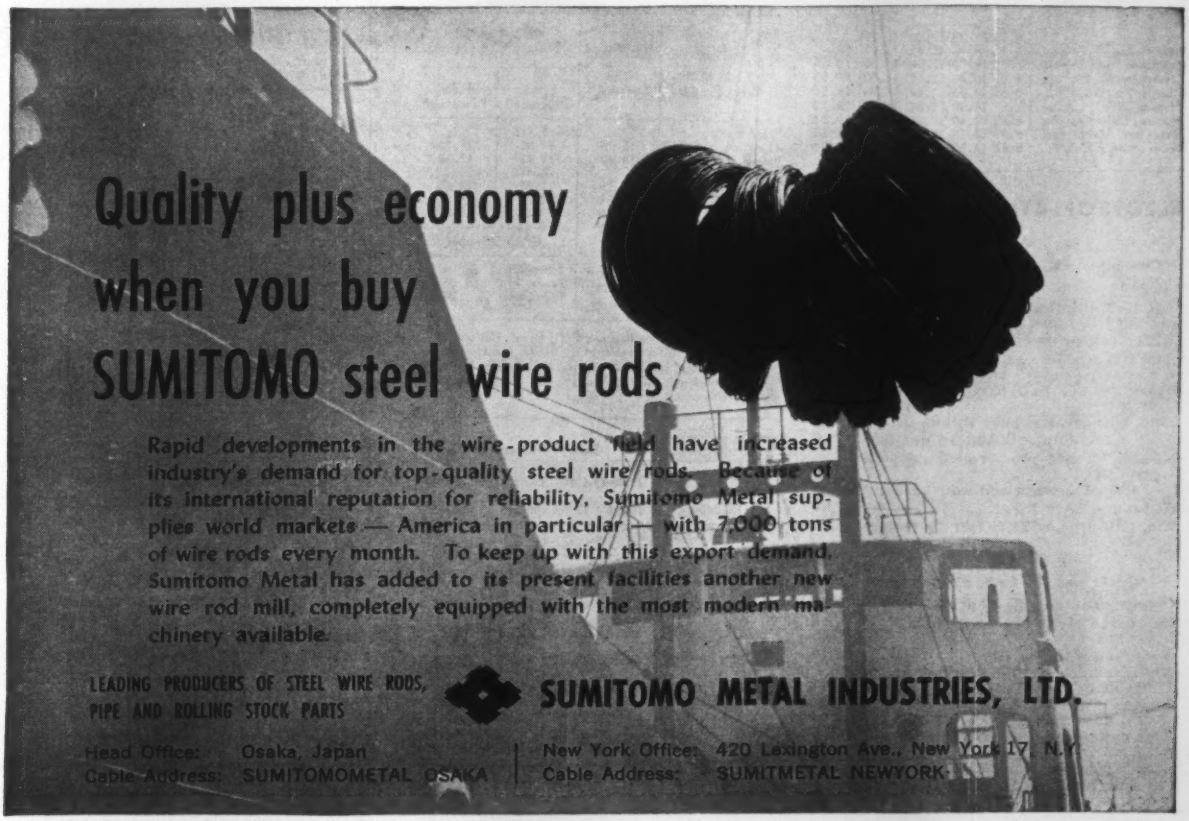
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75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RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	7.025	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Anderson, Ind. *G4*	9.10	.....	.....	.....	.....
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7, S*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 43.50
Electrodeposited, 5000 lb lots 36.50
OFHC anodes ..... 41.50 to 44.50
(depending on shape)
Brass, 80-20, ball anodes, 2000 lb or more 50.50
Zinc, ball anodes, 2000 lb lots 18.75
(for elliptical add 1¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb ..... .945
(Rolled depolarized add 3¢ per lb)
Cadmium, 5000 lb 1.60
Tin, ball anodes $1.26 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum, N. Y.. 65.90
Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45
Nickel sulfate, 5000 lbs 29.00
Nickel chloride, freight allowed, 100 lb 45.00
Sodium cyanide, domestic, del'd east of Rockies, 200 lb drums.... 25.80
Zinc cyanide, 100 lb, N. Y. 60.75
Potassium cyanide, 100 lb drum N. Y., del'd east of Rockies..... 46.50
Chromic acid, flake type, 10,000 lb or more, N. Y. 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50
Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75
Carbonyl Iron (200 lb lots) 88.00
Welding Grades 8.10
Cutting and Scarfing Grades 9.85
Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades
Electrolytic, domestic, f.o.b. shipping point. 15.00†
Atomized ..... 44.3 to 62.3
Reduced ..... 15.00†
Chemically Precipitated 45.5
Brass, 5000-lb lots ..... 33.1 to 50.3
Bronze, 5000-lb lots ..... 51.0 to 55.8
Chromium, electrolytic 5.00
Lead ..... 7.50†
Manganese, electrolytic ... $1.00
Molybdenum ..... $3.60 to $4.35
Nickel $1.15
Carbonyl Nickel, 20,000 lb lots $1.01
Nickel-Silver, 5000 lb lots.. 54.7 to 67.3
Silicon 70.00
Solder ..... 7.00†
Stainless Steel, 316 ..... $1.07
Stainless steel 304 ..... 89.00
Tin ..... 15.00†
Titanium, 99.25 + pct, per lb, f.o.b. $11.25
Tungsten, carbide grades... $3.25
Zinc ..... 19.5 to 27.5

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	.....	.....
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, $43.85; 1 side, $36.60.

(Effective June 26, 1961)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00
High duty (except Salina, Pa., add $5.00) 133.00
Medium duty 125.00
Low duty (except Salina, Pa., add $2.00) 103.00
Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00
Childs, Hays 163.00
Chicago District 168.00
Western Utah 183.00
California 185.00
Super Duty
Hays, Pa., Athens, Tex., Windham, Warren, O. 163.00-168.00
Silica cement, net ton, bulk, Chicago 26.75
Silica cement, net ton, bulk, Ensley, Ala. 27.75
Silica cement, net ton, bulk, Mt. Union, Pa. 25.75
Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

Standard chemically bonded, Baltimore, Md. $620.00
Gary, Ind. 658.50
Standard, Pascagoula, Miss. 647.50
Standard chemically bonded, Curtiner, Calif. 119.00
Burned, Baltimore 585.00

Magnesite Brick

Standard, Baltimore $715.00
Chemically bonded, Baltimore 655.00
Chemically bonded, Pascagoula, Miss. 682.50

Grain Magnesite

St. ⅜ to ½-in. grains
Per net ton

Domestic, f.o.b. Baltimore in bulk. $73.00
Domestic, f.o.b., Pascagoula, Miss... 80.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 46.00
in sacks 52.00-54.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:
Pa., W. Va., Ohio $16.75
Missouri Valley 15.60
Midwest 17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

* Electricweld only.

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AT 10 AM ON PREMISES

Gear Machinery: 3 Cleveland 8 Spindle model 220 Rigidhobbers; 2 National gear shavers; 2 Michigan model 860A & 870 finishers; 30 Barber Colman #12 hobbers, 2 Gleason 8" universal generators, 15 Gleason 15" bevel generators, 5 Gleason 15" pinion roughers, 30 Fellows type 7 & 7A high speed shapers, 2 Cimatool Chamfering machines, Gleason burnisher, 3 P & J vertical gear millers, 10 Gleason and Garman gear testers; **Automatic screw machines:** Conomatic 8 spindle 2⅝ capacity, National Acme 6" model RPA8, 2 National Acme 4 spindle; **Broaching machines:** Colonial model A-1-6-48 hydraulic, 2 American model H-15-60 and H-6-48 hydraulic automatic; **Lathes:** 13 J & L 8" x 12" Fay automatic, J & L 2 spindle, 2 P & J 50 hydraulic, 2 W & S 16", 2 Sundstrand 8"; **Turret Lathes:** W & S 16", Foster 16"; **Gear Head Engine and Tool Room Lathes:** W & S #3 g.h., 2 Reed 16" & 18", 2 MF short cut, Robbins 12", 3 Adams, Carbo Lathe 12" & 18"; **Tapping Machine & Drill Presses:** Cleveland model E24 lead screw tapper, Baker #314A N.D. 24", 8 Baker #217 H.D. 22", 3 Baker 26" H.D. Multi Spindle, Barnes 20" heavy duty, 8 Cincinnati, Avey and Sipp 2 spindle, 15" x 24", 11 Colburn, Aurora, Leland, Atlas, Buffalo and assorted 14" to 26"; **Grinders:** 5 Norton 10" x 18" cylindrical, B & S #4 cylindrical, Heald #22-16" Rotary surface grinder, 2 Heald #70 & 75 internal, Bryant #16416 Chucking, Norton M-F Cincinnati, Stanley and assorted pedestal and bench; **Punch Presses:** — 2 Ferracute punch presses, model E56, Toledo #12, 2 Niagara #101, miscellaneous tools include Rockwell hardness testers, test stands, quench tanks, heat treating furnaces, sand blasting machines, etc.; **Generators & Compressors:** GE 35KW motor driven generator set, Worthington 125 hp motor air compressor, 2 I-R steam driven Imperial, 5 small motor driven compressors and generator sets; **Handling Equipment:** Farmall tractor, Yale electric platform lift truck, hydraulic lift trucks, 7000' chain conveyor, 6000' 600 V bus duct, 2000 fluorescent lights, Yale I-R and assorted ½ to 2 ton electric chain hoists, factory trucks, roller conveyor, large quantity motors, 5 hp to 150 hp, benches, tables, finishing equipment, etc. Complete modern cafeteria with stainless steel refrigerator and heated service counters, warmer, coffee urn, kitchen equipment, chairs and tables, dishes, etc. **Office Equipment:** Includes Ozolid model B White print machine, desks, chairs, steel files, safes, water coolers, etc.

EXHIBITION:

Friday, July 7 and Monday, July 10

From 10 AM to 4 PM

WRITE FOR LITERATURE

SAMUEL T. FREEMAN & CO., AUCTIONEERS

1808 CHESTNUT ST., PHILA. 3, PA.

Farwest Dealers Reflect Optimism

Used machinery dealers in the Farwest are optimistic over the business outlook.

In some instances, sales are running 25 pct ahead of last year. This should continue.

■ All along the West Coast, used machinery dealers are again optimistic about the business outlook. They're riding an upward sales curve. And they feel business should continue to get even better.

"We're running at least 25 pct head of the first quarter," one dealer told The IRON AGE.

Another pegged the improvement at about the same amount. He predicts the balance of this year should be still better.

At the same time, dealers say buyers can get good bargains. They talk of equipment that sold for $12,000 and $13,000 last year and now sells for $7000 or $8000.

Low Prices—One dealer is puzzled. He's able to buy equipment at very good prices and reasons that it's because there aren't too many others around boosting the bids. "Some of the prices we've paid have been ridiculously low," he adds.

Lathes, milling machines, and drills move swiftly.

Another dealer emphasizes the strong demand he's getting for 20 in. heavy duty capacity lathes. He attributes a good portion of the lively demand to the changeover in production.

He also reports a growing number of small shops—machinists who are going into business for themselves. With limited capital, they're turning to used equipment to get started.

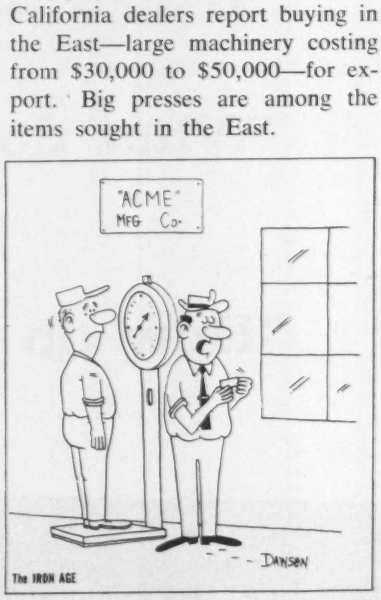
Postive Plans—Now that defense spending plans are prety well jelled, everyone feels he knows which way to move. This also is cited as a reason for the present improvement.

And the number of contemplated new plants and expansions adds more confidence to the outlook.

Dealers say they're getting more inquiries. One important southern California firm claims it has "lots of deals hanging fire." Even if only 50 pct of these convert into orders, the company will be more than happy.

In southern California the demand for shears is greater than the supply. Grinders and big boring mills are moving off dealers' floors at a good pace.

Export Sales — A few northern California dealers report buying in the East—large machinery costing from $30,000 to $50,000—for export. Big presses are among the items sought in the East.



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10 Ton Shaw 52' Span, Cab Oper.
10 Ton Bedford ¾ Yd. Bucket 61' Span

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HP	Type	Speed	Winding
150/200	MDS418AE2	400/730	Series
75	MD414AE	274/475	Series
45	MD410AE	172/550	Comp.
35/45	MD410AE	132/525	Series
33	MD408AE	126/625	Comp.
15/19	MD406AE	59/650	Series
5	MD403AE	21/700	Comp.
3	C01822	875	Series

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50 Ton Slag Std. Ga. w/260 Cu. Ft. Ladles (2)

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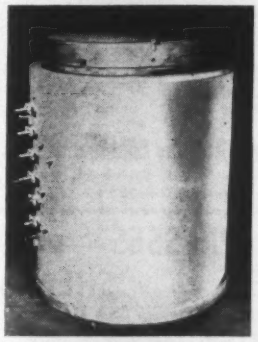

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1	2250 HP	DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V.
1	1500 HP	DC MOTOR 600 V. 600 RPM Whse. M.G. Set. 1500 K.W. G.E. 13,200 V.
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1500	Bliss	#318 mech.	65 x 64	24	32
1500	Bliss	#HS1500 Hydr.	60 x 60	24	71 DLO
720	Bliss	#312 mech.	44 x 50	14	28
720	Bliss	#312A mech.	48 x 50	14	24
700	HPM	CU-2X Hydr. Dbl. Action	36 x 36	36	72 DLO
500	Bliss	#310 mech.	37 x 36	14	24
500	HPM	CU-2X Hydr. Dbl. Action	36 x 36	36	72 DLO
500	Clearing	F1500-42 mech.	42 x 48	14	36
405	Bliss	#309 mech.	34 x 33	14	24
100	Clearing	#S1100-36 mech.	36 x 36	16	17

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183 CFM	150 psi	7 x 7 Joy WG9.
234 CFM	100 psi	9 x 9 Ing.—Worth Chic. Penn.
290 CFM	75 psi	10 x 9 Ing. ES-I
368 CFM	100 psi	12 x 10 Ch. Pn. NSB
485 CFM	100 psi	12 x 11 IR—Worth—CP
528 CFM	100 psi	14 x 12 Ing. Rand ERI
502 CFM	125 psi	12 x 13 Ing. Rand. Worth.
676 CFM	110 psi	15-9¼ x 12 IR-XRE. 125 HP Syn 3-60-440
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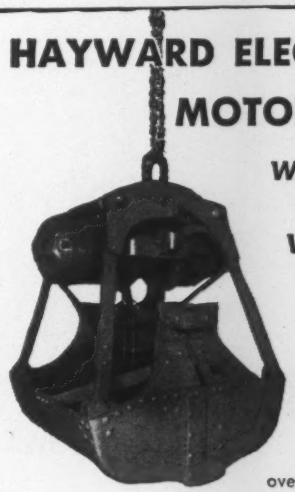
HAYWARD ELECTRIC MOTOR BUCKETS



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Hook onto any electric over-head crane...need no latches, hand lines, ropes or limit switches...can't discharge accidentally while being traversed...operates without need of circuit breakers...motor enclosed against dust, soot and weather...steel and bronze construction...can operate in pits or high-sided cars...*plus many other cost-cutting design features!*

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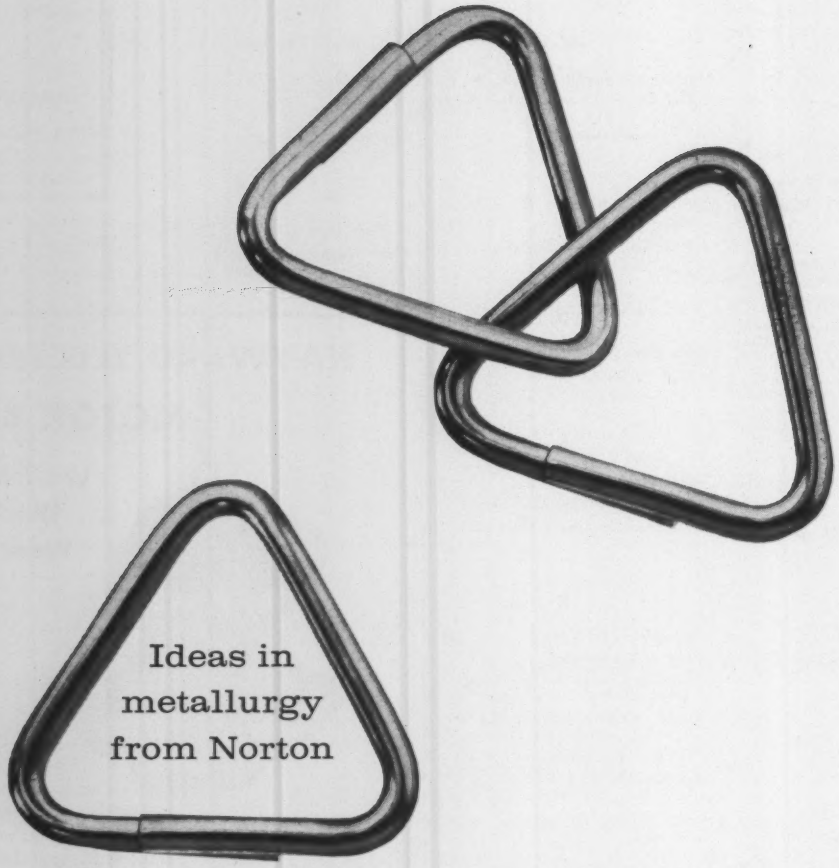

Metals are *born* in refractories. And most new ideas in metallurgy call for a new idea in refractory science . . . because a metal can be only as good as the refractory which contains it. Norton makes the finest.

The crucible of the reduction bomb, where uranium and plutonium burst into being, is a Norton product, pure magnesium oxide.

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More super-alloys for missiles, submarines and space vehicles are possible through new vacuum melting techniques with high purity fused magnesia made by Norton. And in the aluminum industry, new efficiencies are being achieved with reduction cell linings of silicon carbide and cathode bars of titanium diboride.

In metallurgy as in other fields, Norton is crystallizing ideas into products to solve many problems . . . through oxide fusion and in probing experiments in carbides, nitrides and borides. Norton is ready to work with you in engineering materials to meet your needs. Write NORTON COMPANY, Refractories Division, 205 New Bond St., Worcester, Mass.

NORTON
REFRACTORIES
Crystallizing ideas into products

Gary adds fifth Wean Line to step up pickling capacity

United States Steel Corporation recently installed this new Wean pickling line to give its Gary, Indiana plant increased capacity in its pickling department. The new line incorporates modern design features that make higher operating speeds possible without increasing the physical length of the pickling tanks.

This has been principally accomplished through the addition of a secondary scale breaking function, performed by a temper mill and two bridles. Another factor in increasing speed is the advance coil preparation station which trims end scrap before coils are fed into the line. In combination, the design improvements give the Gary No. 5 line entry speeds up to 2,000 fpm and pickling tank section speeds to 1,000 fpm. Entering coils of 62″ O.D. and 25,000 lbs. maximum can be built to 78″ O.D., 60,000 lb. coils.

This ultra-modern installation is one of the 85 pickle lines Wean has designed to serve the steel industry. It represents over 30 years of Wean's engineering experience in developing high-speed coil processing lines that serve every major American steel manufacturer—an unequalled background of "creative engineering" to serve you.

WEAN

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MACKINTOSH-HEMPHILL DIVISION PITTSBURGH U.S.A.

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